Dental Abstracts

a selection of world dental literature

AMERICAN DENTAL ASSOCIATION

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Dental Abstracts has these purposes

1. To present a selection of pertinent literature representative of all points of view within the profession;

2. To provide, by a few hours' reading each month, a survey of the significant advances being made by dentistry throughout the world, as reflected in current dental literature; and

3. To supply enough data in each abstract so that the reader may determine whether he wishes to refer to the original article for more complete information.

The abstracts are grouped in broad classifications. The specialist will learn from this periodical of work done in other fields as well as in his own. The general practitioner will be able to keep abreast of modern knowledge in the various specialties. Articles from which abstracts have been made are on file in the Library of the American Dental Association and may be borrowed by members of the Association. Requests for articles should be addressed to the Bureau of Library and Indexing Service, American Dental Association, 222 East Superior Street, Chicago 11, Illinois. Only three articles may be borrowed at one time, and they may not be kept longer than one week. No charge is made to Association members for this service.

Anesthesia and analgesia

Mouth-to-mouth airway

Peter Safar. *Anesthesiology* 18:904-906 Nov.-Dec. 1957

A new technic of mouth-to-mouth artificial respiration utilizes a special oropharyngeal artificial airway made by fusing two conventional oropharyngeal airways to form an S-shaped instrument.

For an adult patient, the long end of the airway is inserted; for a child, the short end. The part of the airway which remains outside serves as a mouthpiece for the person providing the artificial respiration.

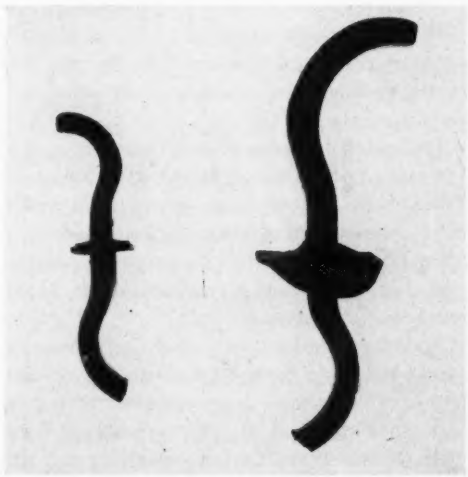
The patient's head is extended. The angles of the mandible are grasped with both hands, and the rescuer pulls forcefully upward. The patient's nostrils are closed with the operator's thenar eminences. The soft rubber disk on the airway, although not essential, helps seal the mouth with the thumbs over the patient's lips. The operator takes a deep breath and blows into the mouthpiece, forcefully in adults, gently in children, and only with "puffs" from the oral cavity in newborn babies. The patient's chest is watched constantly. When the chest rises the operator takes his mouth off the mouthpiece, turns his face to the side, and lets the patient exhale passively. If the chest does not rise, the extension of the patient's head and the support of the mandible are improved and the operator blows more forcefully. Air is blown into the stomach only when there is obstruction of the air passages or when too high inflation pressures are used. Gastric distention is self-limiting, but if it occurs, gentle manual pressure over the epigastrium between breaths will expel the air. The inflations can be repeated about 20 times a minute, or at any rate considered necessary. Depressed spontaneous respirations may be assisted satisfactorily with this technic by using short "puffs" of large volume immediately after the patient starts inspiring.

In a controlled study of 130 laymen and physicians who performed various methods of artificial respiration on ten anesthetized and curarized adult volunteers and ten apneic patients it was found that tidal volumes greater than 1,500 ml. could be moved in all subjects with the mouth-to-mouth and the mouth-to-airway technics. The Holger-Nielsen and the Silvester methods did not move more than deadspace air in 50 per cent of the volunteers whose tracheas were not intubated.

With the mouth-to-airway technic described, breaths of about 1,000 ml. each, at a rate of about

Diagram of mouth-to-mouth airway

Operator inflating the patient's lungs by blowing into the mouthpiece of the airway



12 per minute, could be maintained by untrained laymen for periods up to 30 minutes without fatigue or dizziness in the rescuer.

Advantages of the mouth-to-airway over the direct mouth-to-mouth technic are: (1) more acceptable and pleasant for the operator; (2) better pulmonary ventilation; (3) less fatigue of the operator; (4) less gastric distention of the victim, and (5) fewer failures, because maintenance of a patent upper airway is easier. The airway can be carried in the pocket.

Baltimore City Hospitals, Baltimore 24, Md.

Subglottic stenosis: a cause of difficult intubation

F. J. Colgan and A. S. Keats. *Anesthesiol.* 18:265-269 March-April 1957

Stewart and Pinkerton recently reported an instance of an unsuspected subglottic (tracheal) stenosis in a 62 year old man. The diagnosis, subglottic stenosis, was confirmed by the inability to pass an endotracheal tube, much smaller than the glottic opening, more than a few centimeters below the vocal cords.

Two similar instances were observed at the Veterans Administration Hospital in Houston, Texas. Both patients were young children in whom surgery for correction of inherited oral abnormalities was required. A previously unsuspected subglottic stenosis prevented endotracheal (intubation) anesthesia.

The most common type of subglottic stenosis, constriction of the trachea, frequently is symptomless; or, if symptoms are observable, they may easily be attributed to other conditions. Subglottic stenosis usually is congenital but may occur after tracheotomy.

This condition when encountered during intubation anesthesia should be confirmed roentgenographically at the conclusion of the operation and, if localized, immediate tracheotomy is indicated.

It can be anticipated that subglottic stenosis will be an increasingly frequent problem in pedodontic practice as more children are intubated for routine anesthesia.

Veterans Administration Hospital, Houston, Texas

Hypnoanalgesia: the use of hypnosis in conjunction with chemical anesthesia

Milton J. Marmer. *Anesth.& Analg.* 36:27-31 Nov.-Dec. 1957

During the past ten years new interest in hypnosis has become evident, and the use of hypnotic technics in anesthesia is being re-evaluated. The opportunity for using hypnosis alone, as the total anesthetic procedure for major surgical procedures, is rare. For minor operations or for short procedures, such as reductions of simple fractures, dental extractions, or incision and drainage, hypnosis often provides adequate anesthesia. Hypnosis, however, has its greatest usefulness in anesthesiology as a means of producing sedation before and after surgical procedures and as an adjunct to chemical anesthesia. Hypnoanalgesia can make it possible to reduce the dosage of chemical agents by as much as 50 per cent.

The maximum beneficial effects from both methods are derived when hypnosis is combined with other means of anesthesia. Such a combination avoids overdepression by narcotics and sedatives, and permits the safe alleviation of anxiety and apprehension. Not every patient responds to hypnosis, but nothing is lost by attempting an exercise in relaxation, in the nature of a trial attempt at hypnosis. Most patients derive some benefit from such an exercise even if deep hypnosis cannot be achieved. The softness of vocal tones and the sedative monotony of the vocal patter almost necessarily make for some measure of relaxation.

Successful hypnosis is a valuable therapeutic tool. It can produce sedation or analgesia without any toxic effects, permit the use of minimal amounts of chemical anesthetic agents and allow the patient to retain his protective reflexes so that accidental injury in unanesthetized regions may be avoided. Perhaps its greatest value lies in the useful results obtained with posthypnotic suggestions. Such suggestions can reduce greatly the vicissitudes of the postanesthetic and postoperative periods. Amnesia, partial or complete, permanent or transient, can be induced; nausea and vomiting can be reduced or eliminated, and breathing can be improved. Posthypnotic suggestions can aid in reducing postoperative pul-

monary complications, allow for earlier intake and retention of fluids, and in many instances alleviate postoperative pain and discomfort, thereby reducing the need for narcotics.

The only disadvantage of hypnosis is that it is time-consuming, but any therapist who has witnessed its rewarding effects will agree that it is time well spent.

Five case histories are presented.

Cedars of Lebanon Hospital, Los Angeles, Calif.

Explosion hazards in anaesthesia

J. M. Wishardt. *Canad.Anaesth.Soc.J.* 4:143-146 April 1957

Explosions or fires, of either major or minor proportion, occur approximately five times in 100,000 instances of all types of anesthesia.

Many authors have suggested that the use of all flammable anesthetic agents should be prohibited. In fact, some hospitals in the United States ban cyclopropane, ethylene and other flammable anesthetics. Such a ban, generally applied, creates a hazardous limitation on dental and medical practice because many of the anesthetic technics depend on the use of powerful drugs even if their application requires more skill and care to induce safe anesthesia. Such objections also could be made against the use of roentgen rays and other forms of radioactivity.

Explosions or fires occurring during anesthesia in dental or medical practice, however, are mainly the result of carelessness or negligence, and seldom the result of the explosive property of the specific anesthetic used.

Even if all safety measures are maintained, from the physical standpoint it will be necessary to ensure that all persons present during anesthesia and surgery know of and execute all the safety precautions required.

During the last years, the safety record of dental anesthesia has greatly improved. Although part of the credit for this improvement can be attributed to advances in the pharmacology and technics of anesthesia, the main credit is due to the acceptance by the dental profession of the responsibility of the dentist for the patient who is to have anesthesia in the office. Anesthesia in the dental office has become a routine and safe procedure.

170 St. George Street, Toronto 5, Ontario, Canada

Fainting and cerebral damage

F. F. Cartwright. *Lancet* 273:643 Sept. 28, 1957

J. G. Bourne's article in the September 14, 1957, issue of *Lancet*, drawing attention to some of the dangers of dental anesthesia, was excellent. Bourne reported 14 fatalities in the course of dental anesthesia in two and a half years. During the period reviewed by Bourne, in an estimated 3,166,000 dental anesthesia administrations, there was a mortality of 1:226,000. In two London teaching hospitals, at which records stretch back for 32 years, one death occurred in an estimated total of 400,000 administrations.

The inferences to be drawn from these figures are, first, that the present method of dental anesthesia, with all its imperfections, is comparatively safe, and that attempts to introduce other methods should not be made without due consideration. Second, there is no cause for complacency, for the figures suggest that the mortality can be reduced by almost half.

Bourne suggests that danger may be avoided or reduced by use of the supine position. The supine position is dangerous in outpatient dentistry because it increases the risk that the patient may inhale saliva, blood and even teeth. The inhalation of quite small amounts of blood may cause death.

The avoidance of anoxia, as Bourne stresses, is entirely desirable. All forms of anesthesia are potentially lethal, just as driving a car is potentially lethal. No person should be permitted to administer an anesthetic unless he has been trained to do so, is aware of the problems that may be encountered, and knows how to deal with those problems. Nor should safety be sacrificed to expediency.

Otford, Kent, England

Operative dentistry

Finishing amalgam restorations

G. F. Kantorowicz. *D.Practitioner* 8:64-69 Nov. 1957

A matrix band is essential to the production of a satisfactory amalgam restoration of proximal regions. The matrix provides a fourth firm wall against which the plastic filling material can be condensed to give a well-adapted homogeneous filling and to maintain the correct form during the initial stages of setting. The band should be thin enough to keep the space between the filling and the adjacent tooth to a minimum. Too thin a band will yield excessively under the pressure used during condensation, resulting in overhanging gingival margins and poor proximal contour. The band should be withdrawn buccolingually whenever possible to avoid disturbing the contact area.

"A large self-cleansing area between two teeth, accessible to the toothbrush, or none at all" must be the rule when restoring proximal cavities.

In many instances it is impossible, without the use of a wedge, to obtain close adaption of the matrix band to the tooth at the cervical margin. A variety of wedges can be made from an ordinary wooden tongue spatula, the average thickness of which is 2 mm. Different shapes and sizes of wedges can be cut with a knife. They are economical and efficient. A wedge of this type, with triangular cross section, will, when inserted properly, press the matrix band against the tooth to be filled, while the other side presses the proximating tooth away within the limits of the physiologic movements of the tooth. This will compensate for the space occupied by the matrix band during the packing of the amalgam. On withdrawal of the wedge and the matrix band, the adjacent tooth returns to its normal position, ensuring a contact area. The base of the wedge rests firmly on the soft tissues (Fig. 1).

An amalgam restoration is contoured, to obtain good occlusion combining maximum function with strength, and to prevent the retention of food debris in the interproximal areas.

A filling should provide maximum contact in functional occlusion and should not interfere with any excursive positions. The marginal ridge normally should be restored to the same height as the marginal ridge of the adjacent tooth. Only in instances of severe over-eruption of a tooth may the marginal ridge be adjusted to follow the general pattern of the occlusion rather than be restored to its correct height. The marginal pit is another anatomic feature which should be reproduced when contouring a filling to ensure that food is deflected into the embrasures and on to the occlusal surface of the tooth rather than into the interproximal spaces.

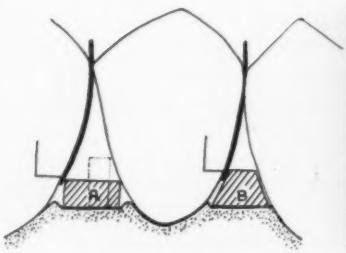


Figure 1 Wedge A may turn over at critical moment because it is rectangular, thus leaving a gap cervically between matrix band and tooth. Wedge B rests firmly on gingiva, and because it is triangular it is in contact with the proximal tooth, pressing the matrix band firmly against tooth

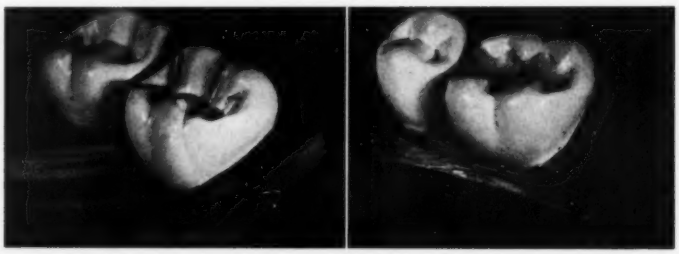


Figure 2 Left: An amalgam restoration contoured to reproduce the anatomic features of the tooth. Right: An amalgam restoration that simulates rather than reproduces the anatomic features, giving the restoration added strength

Figure 3 Left: A ground section of a bicuspid with an occlusal filling (superimposed) contoured to reproduce the anatomic outline of the occlusal surface, leaving the margins of the filling weak. Center: An occlusal filling with a flat occlusal surface which should result in a filling of maximum marginal strength, but which probably would result in occlusal interference and an unnatural appearance. Right: A modified filling with strong marginal edges, that simulates but does not reproduce the anatomic features of the tooth

When the filling exactly reproduces the anatomic features of the tooth, maximum strength does not result. The carving of deep fissures only weakens the filling and may result in fracture. For maximum strength, the exact anatomic features of the tooth being restored with an amalgam filling should be simulated rather than reproduced (Fig. 2 and 3).

Thorough polishing will increase the resistance of an amalgam filling to corrosion (although the surface may still tarnish slightly), and will render the filling smoother to the tongue and less likely to have food sticking to it. Such a filling enables the patient to maintain a high standard of oral hygiene.

A well-condensed filling does not require much polishing. Finishing burs and fine grit stones will remove most of the scratches and rubber pumice may be used subsequently. A good polish is obtained with a brush and zinc oxide and alcohol. The most suitable brush for polishing is one made with goat hair. The durability and flexibility of goat hair far exceed those of natural bristle and nylon.

Royal Dental Hospital of London, School of Dental Surgery, London, England

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Histopathological study on comparison of effects of various filling materials on human dental pulp

Shusaku Fukushima. *Shikwa Gakuho* 57:1-7 Aug. 1957

Cavities were prepared in 122 healthy teeth of 104 patients 14 to 51 years old. The cavities were filled with amalgam or with inlays made of such metals as pure gold, 14-carat gold alloy, silver alloy and tin-antimony alloy, and acrylic resin. The fillings or inlays were left in place for 30, 50 or 100 days, and the teeth were extracted, sectioned and examined.

In the teeth extracted immediately after the cavity preparation, no change in the pulp tissue occurred when the pulpal wall was thicker than 1.5 mm., that is, when a shallow cavity was prepared. When the pulpal wall was less than 1.5 mm. thick, however, the arrangement of the odontoblasts changed. When extra deep cavities were prepared, bleeding and regressive changes of the odontoblasts and pulp cells occurred.

The main changes appearing in the pulp beneath inlays of metal or acrylic resin were as follows: calcium deposition in the predentin immediately below the cavity; regressive change in the odontoblasts; disturbance of blood circulation and atrophy of cells in the pulp tissue, and bleeding in the root canal.

In time the altered odontoblastic layer beneath the cavity floor gradually returned to its normal

condition, and secondary calcium deposition of the predentin was increased. Disturbance of the blood circulation and the regressive changes in the pulp tissue, and bleeding in the root canal pulp, became intensified with time. Atrophy of the pulp cells and bleeding in the pulp were slightly more pronounced after filling with amalgam than after the placement of metal inlays.

When zinc oxide-eugenol cement was used as a lining, more bleeding but less cellular atrophy occurred in the pulp tissue.

The various filling materials affected the pulp in this ascending order: 14-carat gold alloy inlay, tin-antimony alloy inlay, acrylic inlay, pure gold inlay, silver alloy inlay, and amalgam filling.

Tokyo Dental College, Tokyo, Japan

Ultrasonic applications with heavy pressure: a histological report

Robert E. Sausen and James R. Jensen.
North-West Den. 36:310-315 Sept. 1957

A study was undertaken to investigate the histologic effects of applying the Cavitron machine with abusively heavy pressure to the teeth of three young monkeys. The animals were sacrificed at 50 hours, 14 days and 31 days. Direct oral observations and histologic studies resulted in the following conclusions:

1. After seven seconds, painful heat was produced in the operator's finger held on the buccal mucosa.

2. The deciduous labial or buccal mucosa rapidly became gray and necrotic; all this tissue sloughed away within one week. The deciduous teeth became increasingly mobile until all but one of the anterior teeth were gone by one month. The lingual gingivae lost all attachment to the remaining deciduous teeth, and the adjacent permanent teeth showed gingival deterioration which extended from the deciduous teeth.

3. At two days the teeth operated on showed loss of odontoblasts with vacuolization and regions of necrosis. All pulp chambers became nonvital.

4. In developing tooth buds, ameloblasts on the side of the operation were destroyed and odontoblasts were injured severely. Hyperemia prevailed throughout the pulp. By one month, a moderate pulpitis persisted in the occlusal or incisal half of the bud. Odontoblasts were normal, but a wide increment of irregularly calcified dentin had formed. The shape of the root end of the bud was deformed, or had denticlelike outgrowths into the pulp. Enamel growth at the incisal edges or cusp tips had ceased where the inner enamel epithelium was destroyed.

5. At two days the periodontal tissue and alveolar bone showed inflammation which increased in severity toward the apex of the tooth. Inflammation was slight on the first permanent molars. At one month, the investing tissues of the deciduous teeth were destroyed and the periodontal space filled with pus and sequestrated bone particles. The periodontal ligament of the permanent first molar was normal.

6. There was a pronounced difference in the reaction of deciduous teeth and adjacent permanent teeth. The deciduous teeth and investing tissues were damaged severely, whereas the permanent teeth showed minimal effects. Training and experience with the machine are needed before its clinical use, and the use of the Cavitron machine on deciduous teeth is contraindicated until further study determines its limitations.

University of Minnesota School of Dentistry, Minneapolis, Minn.

Pedodontics

Thumbsucking and its control

William S. Brandhorst. *Fort.Rev.Chicago D.Soc.* 34:11-16, 32 Nov. 15, 1957

Lewis (1930, 1931) found that thumbsucking caused deformation of the dental arches and that self-correction usually occurred if the habit was broken at five years of age. Swinehart (1938) noted the high incidence of malocclusion associated with thumbsucking. The cause and effect relationship between thumbsucking and the distortion of the anterior part of the dental arches is well established.

No great amount of damage to the position of the permanent teeth results if the thumbsucking habit is stopped at four to seven years of age.

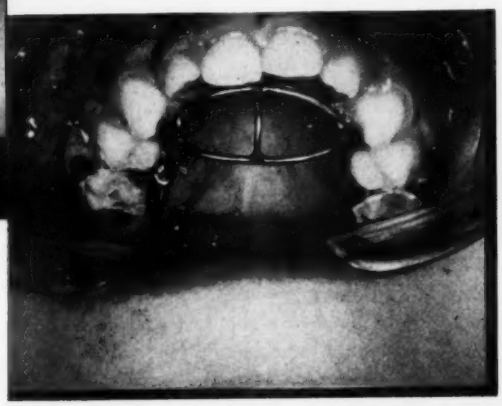
Starr, a psychiatrist, asserts that thumbsucking changes in its meaning to the child. Thumbsucking can be considered nearly normal for the child at one to two years. From two to four years, thumbsucking is no longer normal; it reflects some deeper psychological problem. If the sucking persists beyond the fourth year, it is a symptom of major significance. Starr further states that after four years of age, thumbsucking may continue after the psychological cause for it has diminished or disappeared.

The concept of some physicians that, if the thumbsucking habit is broken, other more obnoxious habits may develop, probably stems from the Freudian concept that the alimentary canal is important to the psychological function of the individual. Although the loss of the tranquilizing effect of thumbsucking may be important to the child, the effect of the teasing which he receives from his peers may be still more important. It is hard to see how any physician would knowingly counsel his patient in such a way as to cause his upper teeth to protrude over his lower lip.

Since early thumbsucking undoubtedly is important to the child, the dentist may permit it to persist, provided it does not do a large amount of damage. The dentist's concern changes as the child's permanent teeth begin to erupt, for now the resulting distortion is more serious. A large portion of the child's facial growth has occurred, and there may no longer exist the same potential for self-correction.

Figure 1 Half of a narrow blade of "popsicle" stick is strapped to the thumb with Scotch tape (not with adhesive tape)

Figure 2 Palatal crib for breaking the thumbsucking habit



If the symptom of thumbsucking develops from a weak cause, the interference of a dental appliance should stop the habit. If the causative factors still are strong, an appliance will not correct the habit.

When the child is first seen by the dentist, the connection between the malocclusion present and the thumbsucking or finger-sucking is discussed with the parents and the child. It is interesting to the parent, and frequently impressive to the child, if the dentist can "guess" which hand is involved and then locate the callous on the finger or thumb. It seems wise to demonstrate to the child how his thumb fits his malocclusion. It is usually possible by this time to sense the desire of the child to be rid of the habit. It is necessary for the child to have this desire if the orthodontic appliance is to be effective as a reminder.

Sometimes the explanation of the effect of thumbsucking on the teeth is enough to stop the habit immediately. Usually, however, an appliance may be placed on the offending digit as a reminder. This appliance consists of half of a narrow blade or "popsicle" stick, strapped to the finger or thumb with Scotch tape (Fig. 1). The patient is shown that he can remove it easily. He is told to ask his mother to help him put it on. He also is cautioned that he must keep it on to make it work. The patient then is seen again in two weeks to a month. Most of the thumbsucking is not stopped this way, but the procedure conditions the patient to working with the dentist and emphasizes the importance of the appliance to come.

As with the tongue blade, the main purpose behind the dental appliance to be used is that of a reminder. Its shape is not critical as long as it interferes with the sucking rhythm. If suction is broken, so much the better.

The soldered, cemented lingual wire with attached crib (Fig. 2) is preferred. Basically, it involves banding of either the upper second deciduous molars or the first permanent molars. The bands should be well fitted and strong. Once fitted, an impression is taken, from which a model is made with the bands in place. A 0.040 wire is fitted in a smooth curve at least as far forward as the cuspids. This wire should touch or nearly touch the teeth at the lingual gingival margin. The wire is soldered to the two bands. Attached at the cuspid region, a half-circle loop of 0.032 wire drops down into the mouth. Bars of 0.025 or 0.028 wire can be run from the lingual wire to the loop to provide added strength. The appliance is polished, cemented and left in place for about six months.

The wire and band material can be either of precious metal or stainless steel. If steel is used, the solder should be 14k gold solder.

The appliance becomes a test mechanism for determining the psychological importance of the thumbsucking habit. If the habit is not stopped, the patient should be seen by a psychiatrist. If, after psychiatric treatment, the habit still remains, another crib will do the job; this time the patient will be happier and better adjusted.

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Relation between habitual breathing through the mouth and muscular activity of the tongue in distoclusion

(Přispěvek k poznání souvislosti ústního dýchání a jazykového svalového systému se zřetelem k disooklusi)

F. Holik. *Československ.stomat.* 57:170-180 June 1957

At the Clinic of the Dental Institute of the University of Plzen, Czechoslovakia, the relation between habitual breathing through the mouth and the development and function of the oral musculature, especially the muscles of the tongue, was studied in serial teleroentgenographic films. The teleroentgenograms were taken intraorally in 24 children with a normal occlusion and in 37 children with distoclusion. The films were taken while the children were breathing through the mouth and through the nose, during masticatory function and with the jaw in rest position.

The observations were as follows:

1. In children with a normal occlusion, the tongue lies at the base of the mouth and its tip reaches to the lingual surface of the lower incisors whether the breathing takes place through the mouth or through the nose.

2. In children with distoclusion, normal breathing through the nose is not attainable.

When breathing through wide open mouth, the tongue is contracted dorsally and its tip reaches to the upper lateral incisors. The tongue appears arched and lies along the soft palate and closes the entrance to the nasopharynx almost completely.

3. During masticatory function, when distoclusion is present, the tongue almost immediately drops from its previous position adjacent to the hard palate. This symptom is especially noticeable in children with distoclusion who have the nocturnal habit of bruxism.

4. During masticatory function, if normal occlusion is present, this symptom was absent even when the children were urged to breathe through the mouth rather than through the nose.

5. Underdevelopment of the oral musculature, especially of the muscles of the tongue, and various degrees of distoclusion were observed in 85 per cent of children who breathed habitually through the mouth.

A definite relation exists between habitual (especially nocturnal) breathing through the mouth and an inferior neuromuscular development in the oral cavity (especially the tongue) which may be a major causative factor of distoclusion.

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"Passing out" of children: cause and treatment

(Das "Wegbleiben" der Kleinkinder: seine Ursachen und Behandlung)

P. Janson. *München.med.Wschr.* 99:779-780 May 24, 1957

In children between one and six years of age, an emotional outburst accompanied by angry crying may result in arrest of breathing during the expiratory phase, followed by rolling of the eyes, thrashing about, cyanosis and sometimes loss of consciousness. This "passing out" [the German term is "staying away"—"Wegbleiben"] is frequently experienced in pedodontic and pediatric practice.

After deep inspiration, the child usually regains consciousness. The condition is an emotional respiratory convulsion and appears usually in neuropathic children. As disturbing as it may be in routine practice, its significance should not be overestimated.

"Passing out" before or during dental procedures generally can be controlled by the pedodontist. It would be a mistake to yield to the whims of a child in the operating room for fear of eliciting a tantrum which may be joined by other children in the waiting room.

When such a tantrum develops, an energetic rather than a frightening attitude is required. A dash of cold water will not only arrest the tantrum and the "passing out" but will reduce or prevent future attacks at the office.

If the parents appear to be too frightened to apply such a measure, a change in the child's environment or an antineuropathic treatment is indicated.

At the office, medication with calcium or mild sedatives may prove effective, and in severe instances, injections with distilled water are recommended.

Waldfischbach/Munich, Germany

Studies on the eruption time of permanent dentition of Chinese school children

Chinese M.J. 3:113, 1956

Statistical studies were made of the eruption time of the permanent dentition of 7,854 Chinese school children whose ages ranged from 5 to 15 years. The children came from both the mainland and Taiwan.

There were no significant sex differences in eruption time. With the exception of the first bicuspids, the lower teeth usually erupted earlier than the corresponding upper ones. The lower central incisors and first molars were the earliest to appear, and the corresponding upper teeth came next.

National Taiwan Science Museum Building, Panchiao, Taipei Hsien, Taiwan, China

Pathology

Clefts in lower lips and mandibles
(Betrachtungen
zur medianen Unterlippen-Kieferspalte)

Luis Ploner. *Fortschr.Kief.Ges.Chir.* 2:263-265, 1957

Median clefts in lower lips and mandibles are far less frequent than those in upper lips and maxillas. The former defects probably are the most uncommon types of facial clefts.

According to statistics, in 1,000 births, two or three clefts in upper lips and palate occur. In 1,000,000 births, however, only four or five clefts in lower lips and mandibles are observed. A cleft mandible without a cleft lower lip is the rarest phenomenon.

At the Department for Plastic Surgery of the University of Milano, Italy, no patient with a complete mandibular cleft, and only two patients with partial cleft in the lower lip, have been treated during the last three decades.

Case 1. The patient, a five year old girl, had a broad median ridge extending from the abnormally dark red surface of the lower lip to the downward positioned mandible. The tip of the tongue also was split in the middle. The alveolar bone was extremely flat. The deciduous dentition was completely erupted but all teeth were deformed and malpositioned.

Case 2. The patient, an eight year old girl, had a cleft in the tip of the tongue extending to a deep ridge from the back to the root of the tongue. There was an imperfect fusion of the two halves of the mandible. The alveolar bone was developed normally. The teeth were well-developed and completely erupted.

The origin of median cleft lips, tongues and mandibles is unknown. Embryologic research has not produced conclusive evidence of the cause of the clefts.

It may be assumed that in the early stage of the embryonic life, a sagittal cleft exists in the middle of the mandible. This phenomenon can be regarded as a remnant of the originally divided subsidiary parts of the mandible which, in later stages, unite, or as a symptom of defects occurring during the embryonic periods of growth and development. The presence of a split tongue, however, suggests that this type of deformity is a defect caused by the persistence of the clefts after the initial embryonic stage.

Wölfer attributes median clefts in lower lips and mandibles to a sudden cessation of normal development. This hypothesis must be rejected, however, because such interruptions in embryologic development have not been observed in unborn offspring of man.

According to the theory of His, the failure of lower lips and mandibles to unite may have caused an alteration in the development of the tongue which in turn produces the phenomenon

Figure 1 Case 1
Median cleft in the lower lip, involving the tongue and the mandible

Figure 2 Case 2. Left: Cleft tongue and defective fusion of the mandible. Right: The oral condition

of the split tongue. According to embryologic research, however, no parallel exists between the development of the tongue and that of the lips or mandible.

In all clefts in facial and oral regions, hereditary transmission is an important etiologic factor, even though this factor cannot be determined in every instance. The presence of isolated clefts in either the lower lips, the tongue or the mandible, seems to be a proof that such deformities arise by mutation.

Steininger, as a result of his experiments with animals, states that all clefts in the facial or oral regions are hereditary. The formation of these deformities is strongly influenced during the early embryonic development by various factors of which he named (1) the age of the mother, and (2) the number of previous births.

Median clefts in lower lips, tongue and mandible occur so seldom that reports of these deformities are rarely found in dental and medical literature. These defects, however, present interesting problems for further research on the normal and pathologic development of the lower jaw.

Pfarrgasse 13, Bolzano, Italy

Familial fibrous swelling of the jaws: report of case

P. Riley, O. Stuteville and R. C. Brown.
Radiology 67:742-745 Nov. 1957

The patient, a five year old boy, showed in clinical observation a deforming bone expansion in both jaws. The alveolar ridges were abnormally widened, and an irregular spacing and a poor alignment of the teeth had developed during the last few months.

Roentgenographic examination revealed the presence of a multilocular cystic formation of the lower jaw and a diffuse increase in density of the upper jaw reaching to the maxillary sinus.

The deciduous teeth had rudimentary roots. The dental follicles for the permanent teeth were irregularly positioned and abnormal in size.

Microscopic examination of specimens obtained by biopsy resulted in findings which were consistent with the characteristics of familial multilocular cysts of bones.

This is believed to be the tenth recorded instance of this rare condition and it displays all the symptoms described in previously published reports.

The family history revealed that the patient's

father and uncle had familial fibrous swelling of the lower jaw during childhood.

The onset of familial multilocular cystic formations seems to parallel the beginning of the resorption of the roots of deciduous teeth, suggesting an "overaction" of normal resorptive processes with the resulting appearance of "pseudocysts," filled with fibrous tissue, in the oral cavity.

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Tumor development, a biochemical problem
(Der Tumor als biochemisches Problem)

J. Kühnau. *Fortschr.Kief.Ges.Chir.* 3:17-22, 1957

Tumor cells differ from normal cells in that they are less differentiated. This reversal to a more primitive stage in cell development is caused by the absence of certain proteins that are present in normal cells either as structural elements or as enzymes. Respiratory enzymes maintain the oxidative process that supplies the energy requirement of normal cells. The tumor cell, however, has lost the faculty of independent respiration and, consequently, because the respiration and the orderly development are closely related, the growth of the tumor cell becomes an uncoordinated process. In the tumor cell the energy required is provided by a more primitive process which is termed "aerobic glycolysis" (Warburg).

The inhibition of respiration in tumor cells is probably caused by the liberation of minute amounts of polycyclic hydrocarbons such as benzypyrene and methylcholanthrene or related substances which enter into chemical combinations with respiratory enzymes, thereby preventing the necessary enzymic action.

Carcinogenic substances may be introduced into the human organism externally in the form of cigarette smoke, combustion products, soot, industrial waste materials and so forth. Under certain conditions (as yet insufficiently determined and understood), carcinogenic substances also may arise internally as the result of abnormalities in steroid metabolism (ovarian or cortical hormones).

The hypothesis that poisoning of the respiratory enzymes is the primary cause of the malignant degeneration of cells provides a satisfactory explanation for the occurrence of certain types of malignant tumors in industrial workers or heavy smokers and in patients in whom ovarian or testicular dysfunction is present.

A number of chemical substances are capable of blocking glycolysis and, subsequently, of suppressing the malignant course in cells during the precancerous stage. Several such "cytostatic" agents have recently been introduced for treatment of malignant tumors. These agents exert their effect by suppressing glycolysis and thereby arresting the development of neoplasms or, as observed in several instances, even causing the cessation of function in tumor cells.

Although this type of chemotherapy still is in the experimental stage, the discovery of specific inhibitors of glycolysis may have opened up new ways in the treatment of malignant tumors in man.

Martinistrasse 52, Hamburg 20, Germany

Pathomorphological changes of the oral mucous membrane in certain gastrointestinal diseases
(Patomorfologicheskie izmeneniia slizistoi obolochki polosti rta pri nekotorygh zabolevaniiagh zheludochno kishechnogo trakta)

J. P. Argunova. *Stomat.,Moscow* 36:4:26-29 July-Aug. 1957

T.T. Shkoliar asserts that 70.5 per cent of the changes in the appearance of the tongue have diagnostic importance in evaluating gastrointestinal diseases. Research was conducted by the staff of the pathological department of the Medicostomatologic Institute of Moscow to determine the relation of certain gastrointestinal diseases to changes in the tongue.

Postmortem material was obtained from 15 subjects, ten of whom had died from dysentery, four from infectious hepatitis and one from toxinfection. Specimens were taken from the tongue, cheeks and gingivae and examined histologically. Inner organs were similarly examined and case histories and autopsy reports were studied.

In all instances the epithelium showed parakeratosis and hyperkeratosis with desquamation of the surface layer. Occasionally, colonies of microbes were found on the surface of epithelium. In the layers of subcutaneous connective tissue,

cellular proliferation and slight edema were observed. Part of the fibers showed dystrophic changes with swelling and homogenization of myoplasm. Early signs of fat dystrophy were seen. Examination of nerve elements revealed thickening of the axis-cylinders, increased impregnation with silver and varicose thickenings.

In patients who had died from dysentery, the mucous membrane was ulcerated to the depth of the basal cells. Irregular hyperchromic cells grew in the connective tissue of the remaining parts of the epithelium.

The most significant changes were observed in the material from the patient who had succumbed from toxinfection of 12 days' duration, accompanied by hemorrhage of the inner organs. The tongue had wide necrotic regions involving subcutaneous tissue, with edema and leukocyte infiltration. The dystrophic changes exceeded the atrophic changes in the subcutaneous tissue. The axis-cylinders in the nerves were drastically broken up.

The mucous membrane of the tongue was most affected by the pathologic changes. It was concluded that the change in the oral mucous membrane was connected with the neurotrophic disorders caused by gastrointestinal diseases. The ulcerations that occurred in severe instances of such diseases are the result of pronounced dystrophic and necrotic changes of the nerve elements.

Medghis, Petrovka 12, Moscow, U.S.S.R.

The condition of teeth in children with malaria

(Sostoianie zubov u detei, pereneschigh malariu)

A. A. Aghmedov. *Stomat.,Moscow* 36:4:16-19 July-Aug. 1957

A higher frequency and intensity of caries are observed in patients who have had malaria. At the stomatologic department of the Azarbaidzhan Railroad Hospital, the influence of malaria on teeth was studied.

The 800 children studied were from 1 to 15 years old. Two hundred were ill of malaria or had recovered; 200 lived in malarial areas but had never suffered from the disease; in the control groups were 200 living in the malaria-free mountain area of Alty-Agash and another 200 living in Shusha.

Of the 200 children who had suffered from malaria, 128 (64 per cent) had caries. Of the 200 children who lived in malarial areas but had never had malaria, 89 (44 per cent) had caries. Of the 200 Alty-Agach children 16 (8 per cent) had caries, and of the 200 children from Shusha 50 (25 per cent) had caries.

The oral condition was considerably better in those children who had been ill with malaria for a short time or who had received a preventive antimalarial treatment than in the children who had suffered from malaria for a longer time. The eruption of teeth was delayed in children who had had malaria.

Medghis, Petrovka 12, Moscow, U.S.S.R.

Examination of the head and neck

Cancer Bul. 9:82-84 Sept.-Oct. 1957

Dentists have established the value of regular dental examinations to promote and maintain health of the oral cavity and the teeth. Furthermore, many patients with such varied disorders as migraine, dizziness, head pains and swelling of the face and neck may visit the dentist before consulting a physician. The dentist is in a strategic position to recognize and diagnose cancer, particularly cancer of the mouth in the early stages. Early diagnosis of cancer of the mouth is sufficiently important that an estimated 80 per cent of deaths from cancer of the mouth could be prevented if the lesions were recognized in early stages and if the patients were given prompt and adequate treatment. Since cancer of the head and neck constitutes about 15 per cent of all forms of cancer, many deaths could thus be averted.

About 85 per cent of oral cancer develops in men and only 15 per cent in women. Most instances occur in the age group from 65 to 69 years, although the range may vary widely.

To detect obscure lesions of the head and neck, examination must be thorough and exacting. A routine should be followed, with the extraoral structures examined first, the anterior intraoral structures next, and the posterior oral and pharyn-

geal structures last. The following procedures may be used:

Face. The skin of the face, neck and the vermilion border of the lips, the ear, and nose should be inspected for crusts, fissures, leukoplakia, and areas of discoloration, and any other abnormalities.

Parotid and submaxillary salivary glands. An early sign of cancer of the parotid gland may be a small nodule or area of irregular induration just in front of the tragus or slightly superior or inferior to the angle of the mandible. For examination of the submaxillary gland, bimanual palpation may be necessary.

Submaxillary and submental lymph nodes. Extraoral palpation may fail to detect changes. Examination should include intraoral palpation, with one finger placed along the floor of the mouth to fix the mylohyoid muscle.

Jaws and temporomandibular joints. The most common neoplasms are adamantinomas which occur primarily in the lower jaw, and the dentigerous cysts, osteomas, and various developmental cysts.

Neck and cervical lymph nodes. Detection of a nodular mass in the neck is an indication for immediate search for a primary cancer in the oral or nasal cavity, pharynx, maxillary sinuses, and skin of the face, ear and neck. Enlarged cervical nodes have been found on initial examination of about 36 per cent of patients with cancer of the head and neck. Hence, the dentist or physician should be skeptical of a dental or tonsillar infection as the presumed cause of enlarged lymph nodes anywhere in the cervical region.

Lips and corners of the mouth. The typical labial cancer appears as a small blister which precedes ulceration. The patient may have a history of a persistent sore with repeated healing and alternate scaly formation that has continued for many months.

Intraoral Examination

Mucous membranes of the lips and cheeks. These surfaces should be inspected for areas of ulceration and induration.

Tongue and floor of the mouth. All surfaces should be examined, with careful inspection for ulceration, immobility, tremor, tenderness, fissures and swelling.

Tonsils, soft and hard palate, and uvula. The tonsillar crypts and the position of the tonsils should be inspected for evidence of injection, ulceration or enlargement. The hard and soft palate and uvula should be scrutinized for clefts, ulceration, perforation, swelling, deformity, and inflammation.

Posterior pharyngeal wall. Significant findings are ulceration, masses, fissures, injection, exudates and changes in the surface appearance.

Gingiva and retromolar area. These areas should be inspected for ulceration, bleeding, hyperplasia or atrophy, and depth of the gingival crevices.

Alveolar bone and teeth. When loose teeth are detected, the cause of the loosening must be determined, especially if a single tooth is loose while the remaining teeth remain firm.

A willingness to investigate any area which differs from the normal is the first requisite for detection of early, curable cancer. It behooves the dentist and physician to take the advice of Bond: "Recognize the possibility of a neoplasm in the unusual case, take a biopsy . . . it's easy enough . . . don't procrastinate and await developments. Time is inexorable, but in oral carcinoma, early recognition and treatment are well rewarded."

Medical Arts Publishing Foundation, University of Texas, Houston, Texas

Metastases of hypernephroma in the oral cavity (Über Metastasen des Hypernephroms in der Mundhöhle)

H. Pfeifer. *Deut.zahnärztl.Zschr.* 12:1186-1189 Sept. 1, 1957

Although metastases of hypernephroma occur rarely in the oral cavity, in isolated instances they are the only indication of the presence of a still undetected primary tumor.

In the case reported, the patient, a 67 year old man, was referred by his dentist to the dental clinic of the University of Heidelberg, Germany, for the treatment of an "epulislike" swelling on

the right side of the mandible. After surgical elimination, the neoplastic growth recurred, increased in size, at the same site.

Histologic examinations of specimens taken from both neoplasms led to the suspicion that metastases of an undetected hypernephroma had occurred in the oral cavity. The structures examined resembled cortical tissue of adrenal glands.

Examination by an internist revealed the presence of similar metastases in both lungs.

The patient was referred to the Tumor Clinic. The diagnosis, metastases of hypernephroma in the oral cavity, was verified after the primary tumor was detected in the left kidney. The patient died before surgical removal of the hypernephroma was attempted.

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Pathology of the virus infection of salivary glands: cytophagous inclusion disease

(Die Bedeutung der Zytomegalie für Pathologie und Klinik)

G. Seifert and J. Oehme. *Deut.med.Wschr.* 82:1759-1761 Oct. 11, 1957

At the Pathologic Institute of the University of Leipzig, Germany, 83 patients with virus infection of the salivary glands (cytophagous inclusion disease or cytomegalia infantum) were observed and treated.

From case reports and postmortem findings it was possible to determine the causative factor: salivary gland virus (Rabula). Virus infection of the salivary glands is common in animals such as guinea pigs, hamsters, mice, rats, moles, foxes, minks and monkeys. A possibility exists of widespread transmission to man. This disease, therefore, can be counted among the potential anthropozoonoses.

The diagnosis consists in demonstration of specific giant cells within the inclusion bodies in tissues or body fluids such as saliva, cerebrospinal fluid and urine. The inclusion bodies are composed mainly of desoxyribose nucleic acid.

The disease frequently occurs in infants and children and is probably caused by intra-uterine infection. Clinically it appears as a generalized, abnormal and depraved condition of the blood and lymph. For differential diagnosis, hepatomegalia and erythroblastosis fetalis should be considered.

In infants and children pulmonary, hepatic, splenic, cerebral, oral or gastrointestinal symptoms may be prominent depending on the organ or tissue attacked. There exists a comparatively high coincidence of the disease with congenital malformations in the oral cavity. Autopsy reports revealed that the salivary glands (especially the parotid gland), the oral mucosa, the kidneys, the lungs and the liver (in order of frequency) are affected most commonly.

Although the disease is comparatively rare in children older than one year (at the institute there were only four older children among 83 patients), in medical literature are case reports describing the occurrence of this disease in juveniles and adults. In those instances, the disease was associated with tuberculosis, syphilis and blood diseases.

Neither adequate prevention nor treatment methods are known. Secondary complications usually cause death. Recently cortisone treatment was attempted which, however, failed to produce improvement.

Liebig Strasse 26, Leipzig, Germany

Pathohistological study on discoloration of the teeth caused by icterus gravis neonatorum

Shigeichiro Matsuda and Sen Uchida. *J.Japan Stomat.Soc.* 24:256-259 Sept. 1957

A study was made from the tooth germs removed at autopsy from two male infants (12 and 8 days old, respectively), and two female infants (seven and five days old, respectively). All had died of icterus gravis neonatorum, severe jaundice in the newborn.

The degree of jaundice of the skin, oral mucosa and conjunctiva was moderate in the first three infants and slight in the fourth. Kernicterus was severe in the first two infants, moderate in the third and slight in the fourth. In three infants Rh incompatibility was demonstrated.

Macroscopically the enamel was greenish pigmented in various degrees and the pulp was

stained a brownish color. Microscopically a yellowish brown pigmentation appeared distinctly in the neonatally formed enamel. The dentin was pigmented a faint yellow. In the pulp, bile pigment was found in the capillaries, and slight pigmentation was diffused in the remaining pulp tissue and enamel epithelium. There were no hypoplastic defects.

Although the pigmentation of the dentin was much less intense than that of the enamel, several other investigators have reported that the pigmentation of the dentin was more severe than in the enamel.

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Malignant oral and pharyngeal tumors

(Maligne Tumoren des Schlundes)

F. Zöllner. *Deut.med.Wschr.* 82:1103-1106 June 28, 1957

In diagnosis and in treatment, neither the oral cavity nor the pharynx can be considered as anatomic units. In the oral cavity, the nasopharynx, the oropharynx and the laryngopharynx, different types of tumors may develop.

Histologically these neoplasms may range from undifferentiated angiomas, fibromas, fibrosarcomas, myomas, myxomas, lymphosarcomas, reticuloendotheliomas to tumors resembling poorly differentiated squamous cell carcinomas.

The histologic picture often varies in different parts of the tumor, thereby making differential diagnosis difficult. It is important, however, to distinguish between differentiated squamous cell carcinomas (in which surgical or electrosurgical intervention is indicated) and the other oral and pharyngeal tumor types (which can be treated by roentgen ray irradiation). In tumors of the nasopharynx, electrocautery is the method of choice.

At the clinic for oral surgery of the Dental Institute of the University of Freiburg/Breisgau, Germany, in 32 patients with sarcomas and carcinomas in the region of the oral cavity or the pharynx, whether surgical (electrosurgical) elimination, roentgenotherapy or electrocautery had been used, a five-year survival was obtained in five patients; a four-year survival in one; a three-year survival in two; a two-year survival in six, and a one-year survival in three.

The inaccessible site of many oral and pharyngeal tumors frequently makes diagnosis and treatment difficult. Intractable neoplasms or metastases are among the most common findings. In all instances of suspected malignancy, the use of endoscopy is recommended.

Recently introduced treatment methods which combine roentgenotherapy and electrosurgery have, as yet, scarcely improved the prognosis, mainly because preoperative tissue destruction is severe in most instances of oral and pharyngeal tumors. The risk of metastasis depends on the site of the primary tumor, and usually the dissemination occurs at an earlier stage than in tumors of other regions.

In severe instances of pharyngeal tumor, complete removal of the larynx and pharynx often is indicated. Immediate reconstruction of an artificial pharynx by a free skin transplantation or the use of Wookey's method (cartilage implants) sometimes obtains certain benefits.

Hugstetter Strasse 55, Freiburg/Breisgau, Germany

Atypical amyloidosis in the oral cavity: report of case

(Kasuistischer Beitrag zur Paramyloidose)

W. Lympius. *Deut.zahnärztl.Zschr.* 12:1238-1240 Sept. 15, 1957

Amyloidosis is a disease in which amyloid deposits are present in the tissues of various parts of the human body. There are three known types of amyloidosis: (1) amyloidosis cutis; (2) lichenoid amyloidosis and (5) atypical amyloidosis.

Common to all types is the accumulation of amyloid in various organs. Amyloid is a complex protein of unknown origin. It is characterized physically by its hyaline property, and chemically by its specific staining reaction. It stains dark brown with iodine in aqueous solutions, mahagony in dilute sulfuric acid and red when heated in metachromatic aniline dyes.

Atypical amyloidosis seldom occurs in the oral cavity. In the case reported, a 70 year old man had gradually increasing swellings on the tongue, gingivae and the floor of the mouth. These symp-

toms appeared after a bilateral conjunctivitis which was resistant to treatment. Microscopic examination of specimens obtained by biopsy revealed that mainly the fibers in the media of the arterioles in the oral cavity were involved, and that amyloid deposits of a particular kind (consisting of two protein fractions and one polysaccharide fraction) were present.

The pressure of the growing tumescenses had caused the parenchymatous cells to become compressed and atrophic. To a varying degree, the mesodermal tissues, the cardiovascular system, the gastrointestinal tract and the lymphatic system also were involved. Isolated and multiple nodes were observed on the floor of the mouth, the gingiva, the tongue, the smooth and striated muscles and the respiratory tract. The liver, spleen, kidneys and adrenal glands were not involved.

The complication of amyloid degeneration was evidenced by the presence of several instances of edema.

Roentgenographic examination revealed the presence of osteoporosis but gave no evidence of plasmocytoma. It was not established whether amyloid deposits were present in or around the heart.

Treatment consisted of high doses of strophantin and obtained a significant decrease in symptoms but no cure. Additional medication with deposit ACTH was unsuccessful.

Death resulted from the involvement of the vital organs.

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Halitosis and fat

Brit.M.J. No. 5062:118 Jan. 11, 1958

Q.—In those with no evidence of infection in the mouth or respiratory tract, may periodic attacks of halitosis be due to delayed emptying of the stomach, as perhaps after a fatty meal? If so, what treatment is advised?

A.—There is a clear-cut relation between fat in the diet and halitosis. It does not seem to be a question of gastric stasis, for the symptoms may persist long after the stomach is empty. It is due probably to the production of volatile fatty acids in the intestine, their absorption into the blood stream, and excretion into the lungs. A low fat diet often greatly improves the condition.

British Medical Association, Tavistock Square, London, W.C.1, England

Exposed and concealed clefts in lip, palate and upper jaw

(Die bezeichneten und versteckten Spaltungen der Lippe, des Gaumens und des Oberkiefers)

J. Vondra. *Schweiz.Mschr.Zahnhk.* 67:874-885 Oct. 1957

Congenital malformations in the maxillofacial region such as clefts in lips, palate and upper jaw may be unilateral or bilateral, complete (exposed) or incomplete (concealed).

Because concealed clefts are often overlooked in routine examinations of the oral cavity, they are thought to be less common than they are.

Statistical data compiled by the staff of the Dental School of the University of Prague, Czechoslovakia, showed that in all patients with clefts, concealed unilateral cleft of the lips occurred in 33 per cent; concealed bilateral cleft of the lips in 7 per cent; concealed cleft of the soft or hard palate in 8 per cent, and concealed cleft of the upper jaw in 5 per cent. Nearly 50 per cent of these concealed clefts were not detected previously.

In contrast to instances of exposed clefts in lip, palate or upper jaw—in which associated abnormalities are rare—, concealed clefts are frequently accompanied by other inherited malformations such as clubfoot, polydactylism, underdeveloped extremities, abnormally formed tongue or spina bifida.

During the last decade, a considerable increase in the incidence of exposed and concealed clefts in lip, palate and upper jaw has been observed in Czechoslovakia. It can be assumed that such an increase is partially due to improved surgical technics used in repair of these hereditary malformations. Because in the majority of instances, oral and plastic surgery obtain almost perfect esthetic results, marriage and intermarriage of patients have increased, and the offspring may inherit a genetic tendency to cleft formations.

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Endodontics

Obtaining access for effective root canal therapy

Charles E. Rudolph, Jr., James H. Snyder and Jay D. Shaw.
Oral Surg.,Oral Med.& Oral Path.
10:1227-1231 Nov. 1957

Although the principle of proper access to the root canal for successful endodontic therapy is acknowledged generally, nonobservance of the principle has contributed to innumerable failures. This may be the result of the lack of a lucid demonstration of the principle, caused by the use of diagrams and sketches rather than roentgenograms. A roentgenographic demonstration of the principle of adequate access to the root canal is presented.

Figure 1, a mesiodistal view of an incisor, shows the lack of access to the entire root canal and the incisal portion of the pulp chamber through an opening that was located too far gingivally. It was necessary to bend the tip of the file in order to enter the root canal.

Figure 2 is a labiolingual view of an incisor which demonstrates that adequate access to the root canal cannot be obtained by entering the tooth through an existing proximal cavity preparation. The tortuous path of the file is evident.

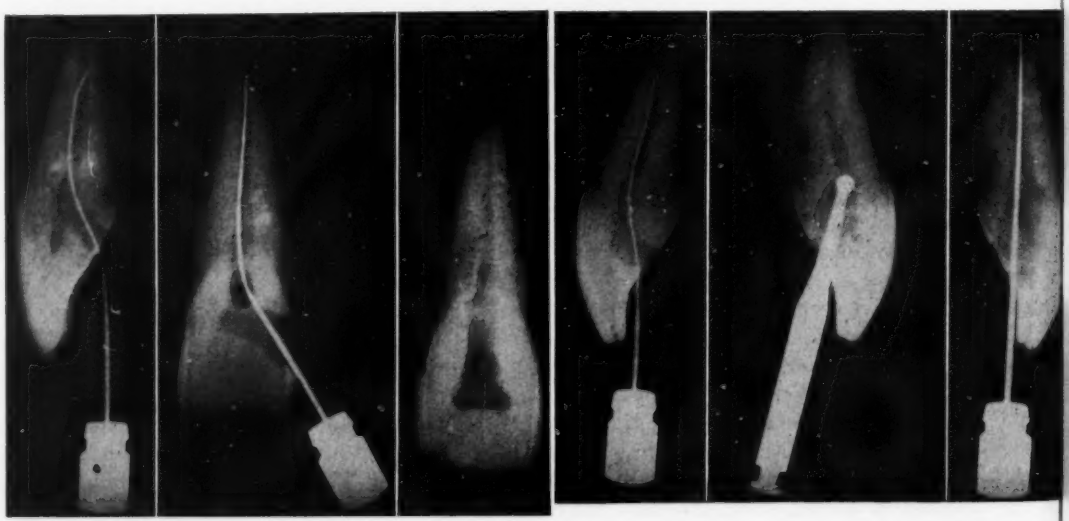
Figure 3 is a labiolingual view of an incisor which shows an adequate opening to the pulp chamber. The root canal has not yet been entered. The heart-shaped contour facilitates removal of the entire contents of the pulp chamber, thereby decreasing the possibility of discoloration of the crown.

Figure 4 is a mesiodistal view of the correct opening into the pulp chamber of an incisor. The tortuous path of the file, however, indicates that adequate access to the root canal is obstructed by the lingual ledge.

Figure 5, a mesiodistal view of an incisor, illustrates the removal of the lingual ledge with a no. 4 bur. This permits subsequent instrumentation of the entire surface of the root canal. The same bur also is used to remove the pulpal contents and any badly stained dentin which might cause ensuing discoloration of the crown.

Figure 6 is a mesiodistal view of an incisor with a file inserted in the canal to the working

Figure 1 *Figure 2* *Figure 3* *Figure 4* *Figure 5* *Figure 6*



distance. The path of the file when the lingual ledge is removed is straight, as contrasted with those shown in the preceding figures. All subsequent instrumentation can be accomplished easily and thoroughly. The danger of breaking an instrument by repeated flexion is minimized.

Eight additional views illustrate other aspects of the problem.

United States Naval Dental School, National Naval Medical Center, Bethesda, Md.

The pulpless tooth in oral rehabilitation

Victor N. Jaffe. *New York J.Den.* 27:178-182 May 1957

The theory that endodontically treated teeth are foci of infection has largely been exploded, and many teeth of the type that were formerly sacrificed now are being retained. A properly treated pulpless tooth or root can provide years of service as a bridge abutment. Any tooth that has a value for restoring the mouth can be treated endodontically, but not all pulpless teeth can or should be saved.

Prosthodontists recognize that the problem of restoration is simplified when key mandibular teeth are retained on which a partial prosthesis may be fitted.

An erroneous idea prevails that it is risky to treat multirooted teeth, particularly maxillary molars, endodontically. Many of these teeth are being saved by the use of silver points which may be forced around the curvatures, by root amputations and by splinting. Successful restorative dentistry can be completed on many posterior abutment teeth which have been altered by amputation of the offending root or roots.

The general health and age of the patient are factors controlling the diagnosis, as is the patient's desire to improve his oral condition.

The advanced technics described—for single-rooted pulpless teeth, for multirooted teeth, for calcified pulps and for pulps that die after cementation—do not require the services of a specialist. It is the professional obligation of the general practitioner to inform his patients that such work is available. Today, teeth are being treated and saved that ordinarily would have been sacrificed.

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Possibility of iodine resorption by the pulp

(Über die Resorptions-Möglichkeiten aus der Pulpa)

K. Göransson. *Neues Zahnk.* 3:221, 1957

In the German medical journal *Die Medizinische Welt,* Kosidowsky described an instance in which hyperthyroidism developed in an iodine-sensitive patient after root canal sterilization with iodoform.

To investigate the possibility of an iodine resorption by the pulp, animal experiments with rabbits were carried out at the Dental Institute of the University of Bern, Switzerland.

After sterilization with iodoform, the root canals of the upper and lower gnawing teeth were filled and sealed. For the chemical analysis, 2.5 cc. of blood from each animal were used.

The findings confirmed Kosidowsky's assumption that the pulp absorbs iodine if iodoform is used in root canal treatment. In each rabbit, an increase in the iodine level was observed. The resorption of iodine by the pulp increased extremely when, besides iodoform, hyaluronidase injections were made.

It can be concluded that in root canal sterilizations in which iodoform is used, especially in patients sensitive to iodine, endocrinous disturbances such as an overactivity of the thyroid gland, similar to that in exophthalmic goiter, may occur.

In endodontics and periodontics, iodoform should be replaced by other anti-infective agents.

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Oral surgery

Intraoral hemorrhage as an accompanying symptom of hypernephroma: report of case

(Massive enorale Blutung als Begleitsymptom eines Hypernephroms)

H. Grasser. *Deut.Zahnärztebl.* 10:283-285 April 22, 1956

In many instances of hypernephroma, the metastases are observed earlier than the primary tumor. In the course of development of the adrenal gland, cortical substance may be misplaced and is often found during the postfetal period in the kidneys, along the urogenital canal, in the liver or the pancreas. These remnants usually remain quiescent during the lifetime; sometimes, however, these cortical substances are transformed into a malignant tumor, the hypernephroma. Microscopically, this tumor shows characteristics similar to the carcinoma.

Hypernephroma has a tendency to hemorrhage, but usually only from the primary neoplasm. Its metastases seldom bleed. In medical literature, only one instance of intraoral hemorrhage caused by a hypernephroma metastasis has been reported (Kaulich, 1948). In dental literature, no instance of intraoral hemorrhage from a metastasis in the oral cavity, transferred from a hypernephroma, has been described.

In the case reported, the patient, a 58 year old woman, complained that for three months there had been a complete lack of sensitivity in her lower lip. A slight swelling was observed in the region of the lower right molars. Biting into a hard roll caused hemorrhage which was checked by the dentist within an hour.

Roentgenograms revealed the presence of a metastasis, probably from a hypernephroma, and the patient was referred to the dental clinic of the University of Mainz, Germany.

The mucous membrane of the oral vestibule and both the hard and soft palate were filled with excess of blood. In the mandible, especially in the region of the right third molar, spongy inflations were perceptible. The third molar was dislocated buccally and showed second degree looseness. From the gingival pocket, distal to the third molar, pulsing blood escaped on slight palpation. The anterior teeth in the mandible were covered with calculus; a partial denture replaced several missing teeth, and the tongue showed a white coating. The pharynx appeared normal.

Roentgenograms revealed a metastatic formation, the size and shape of a plum, reaching from the third molar to the base of the mandible. One root of the molar was inside the swelling. The borders of the abnormal enlargement appeared indefinite, blurred and irregular.

The histologic test excision revealed an abundance of stroma, blood-filled lacunas and induration of the lymphatic glands. No tenderness was observed in the involved tissues.

On the basis of the diagnosis—metastasis of hypernephroma occurring in the mandible—the patient was referred to the clinic for internal medicine. There, the diagnosis was confirmed. The extent of the additional metastases, reaching from the primary tumor in the kidneys to the oral cavity, contraindicated both the surgical elimination of the primary tumor and its metastases and nephrectomy.

Later, at the dental clinic, the third molar which had caused pain during masticatory function, was extracted. Under clinical observation,

Figure 1 Hypernephroma metastasis in the mandible

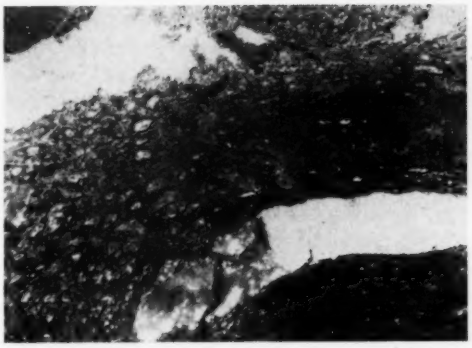


Figure 2 The typical canaliculi structures of hypernephroma metastasis

and after numerous tamponades, the extraction wound and the wound of the previous test excision healed without hemorrhage.

After one year, the patient was recalled, and the examination revealed that no significant changes had occurred; no enlargement of the hypernephroma metastasis in the oral cavity, no new metastases in this region and no cachectic symptoms were observed.

Leibnitzstrasse 32, Mainz, Germany

Common problems in exodontia and oral surgery

Robert B. Shira. *J.South.California D.A.* 25:21-29 Oct. 1957

Although the problems associated with exodontics and oral surgery are not new, their management has changed in recent years with the advent of new surgical procedures and technics, new drugs and new anesthetic agents. Many of the older teachings and beliefs are being re-evaluated in the light of present knowledge.

A common surgical problem is treatment of the acutely infected tooth. In the past, extraction was delayed until the inflammatory process had subsided. Many oral surgeons now extract such teeth immediately, without regard to the length of time symptoms have been present, or the amount of swelling in the soft tissue. Through adequate preoperative and postoperative antibiotic therapy and atraumatic surgery under general or regional block anesthesia, early resolution of the infectious process may be obtained. Extraction produces immediate relief from pain, and usually results in reduction of the swelling by the following day and resolution of the suppurative process without untoward complications.

Pericoronal infection is usually seen in young people when the third molars are erupting. The oral mucosa is broken by a cusp of the erupting teeth, and infection develops under and about the pericoronal flap. Controversy exists regarding the proper therapy. If the infectious process is more or less limited to the immediate soft tissue, and if the offending tooth is so situated that it can be removed with minimal trauma to the surrounding tissue, the treatment of choice is immediate removal of the tooth, with indicated supportive therapy. If, however, the infectious process is diffuse and the tooth in such a position that its removal would require a complicated, prolonged procedure, it may be best to treat the pericoronal infection until it resolves before removing the tooth. Treatment involves drainage and irrigation of the pericoronal pocket.

For years many dentists have advised patients to leave undisturbed asymptomatic impacted third molars. Retention of such teeth may lead to alarming and severe complications, including the resorption of roots of adjacent teeth, disturbances of occlusion because of pressure on proximating teeth, infection, and neurological disturbances. Cysts may form around the crown of the unerupted tooth. Many oral surgeons now recommend removal of these unerupted teeth at an early age, when the surgical procedure is easier and before pathological processes have developed.

Treatment of infections, such as acute cellulitis and osteomyelitis, has been revolutionized with the advent of chemotherapeutic agents and antibiotics in the past few decades. The spectacular response to these drugs has made some practitioners overconfident of their therapeutic value. The employment of antibiotics where no clear-cut indications for their use exist should be condemned. When surgical procedures are to be performed on patients with certain systemic disorders or with histories of rheumatic fever, congenital heart lesions or subacute bacterial endocarditis, prophylactic antibiotic therapy is indicated. Other obvious indications are severe infections about the oral regions, and to prevent

infections in some major traumatic or operative wounds.

Although fractured root fragments usually should be removed in most instances, the fractured root may be allowed to remain in the alveolar process if the surgical procedure required to remove a root would be difficult and traumatic and require the sacrifice of large amounts of supporting bone.

Although for years it was believed that a root forced into the maxillary sinus should be removed as soon as practical, Sprague asserts that foreign bodies, including fractured root tips, often are retained in the sinus for long periods with no apparent ill effect.

Walter Reed Army Hospital, Washington 12, D.C.

Counseling with parents of children with cleft lip and palate

Herold Lillywhite. *Bul.Am.A.Cleft Palate Rehabilitation* 7:3-5 Oct. 1957

The chances of successful habilitation of the cleft palate patient are poor unless the child's parents are prepared and educated. It is largely through the parents that the patient, and others close to him, will be educated on his particular problem.

In the cleft palate program of the University of Oregon Medical School, a series of six letters to the parents of patients is used to repeat, reemphasize and supplement the person-to-person counseling and the printed and Mimeographed material given the parents. The form letters are typed individually with a personal heading.

Letter 1, sent to the parents soon after the child is accepted for treatment (usually within a few weeks after birth), discusses the nature of the service offered, its purposes, the need for many specialists, the nature of cleft palate, the fact that there is no one to blame for it, and reassurance that treatment can permit the child to lead a normal life.

Letter 2, sent after the child has returned home after surgery for closure of the lip, discusses reasons for waiting for another year and a half to two years before closing the palate, infections of the respiratory tract and ear, and speech development.

Letter 3 reaches the family when the child is about a year old. It discusses speech development, the need for stimulation and ear training, tooth eruption, and the pending palate surgery.

Letter 4, sent after the child returns home from palatal surgery, discusses changes that closure of the palate will bring in eating and speaking, and the function of the soft palate.

Letter 5 is sent when the child is about three years old. Good dental health, adequate diet and dental care are stressed and the family is urged to consult the family dentist.

Letter 6 reaches the parents about the time the child is five years old. The pending dental-plastic-speech clinic evaluation of the child is discussed, together with his coming entrance into school.

The series of letters has been used only a short time. The initial reaction is favorable.

University of Oregon Medical School, Portland, Ore.

Classification of sialolithiasis

(K voprosu o klassifikatsii sliunokamennoi bolezni)

A. B. Klementow. *Stomat.,Moscow* 36:3:35-39 May-June 1957

The symptoms and clinical pictures of salivary calculus diseases are varied. The disease can be accompanied with enlarged glands and pain, and it can be asymptomatic, discovered only at examination because of some other condition or when the calculus is expelled. The location of the calculus, salivary disturbances, pain attacks and secondary infection are the main factors influencing the prognosis.

At the Military Academy of Kirow, the department of facial and oral surgery and stomatology has proposed a classification with sialolithiasis divided into three main groups and several subordinate groups.

Group 1 includes sialolithiasis of the duct of the submaxillary, parotid and sublingual glands, and Group 2, sialolithiasis of the submaxillary, parotid and sublingual glands. The subdivisions of those groups are as follows: (1) without clinical symptoms of inflammation of the gland, (2) with chronic inflammation of the gland, and (3)

with a relatively severe chronic inflammation of the gland. Group 3 embraces chronic inflammation of the submaxillary, parotid and sublingual glands secondary to calculus: (1) after expulsion of calculi and (2) after surgical removal of calculi from the duct.

An acute inflammation is not included in the classification. Usually the inflammation is noted after the calculus has existed for some time, resulting in chronic inflammation. Histologic examinations of removed glands of patients with acute symptoms revealed chronic inflammation characterized by hypertrophied connective tissue of the intermediate tubules, atrophy of the secreting alveoli, and extensive lymphocytic infiltration and exudations. Pathologic studies showed that the inflammatory process in the parenchyma of the gland increases gradually with the increase of the calculus.

This classification is recommended as an aid in selecting the most reasonable treatment.

Medghis, Petrovka 12, Moscow, U.S.S.R.

Cylindroma of the oral mucosa or the jaws

(Zur Klinik der Zylindrome im Mund- und Kieferbereich)

Herbert Mehnert. *Deut.Zahn Mund Kieferhk.* 26:462-467 Sept. 1957

According to most textbooks and case reports, cylindromas are comparatively rare in the oral cavity.

At the dental clinic of the University of Halle/Saale, Germany, however, seven patients (three women and four men), afflicted with typical cylindromas of the oral mucosa, the palate, the maxillary sinus and the jaws, were observed and treated almost at the same time.

The oldest patient was 75 years old and the youngest 45. In two patients, the tumor was malignant and recurred after surgical removal. There were many metastases.

At the clinic, surgical elimination of the tumor, and not the usually advocated roentgenotherapy, was the method of choice in five instances. In one patient with a cylindroma of the hard palate, a tissue-saving electrosurgical removal was performed successfully. Radical elimination of the tumor and its surrounding tissues was required only in one instance in which the obviously malignant cylindroma was in the maxillary sinus.

Recurrent and metastatic neoplasms were removed by radical surgery, with jugular ligatures utilized to prevent further development of metastases.

All surgical interventions were one-stage operations because continued disturbance of tissues lying in the vicinity of tumors may promote malignancy.

Cylindromas in the oral cavity are by no means harmless swellings or growths. Inadequate treatment frequently leads to malignancy, metastatic formation or recurrence.

Grosse Steinstrasse 19, Halle/Saale, Germany

Malignant disease of the ethmoid and maxillary antrum

J. McAuliffe Curtin. *Irish J.M.Sc.* Sixth series, No. 383:488-500 Nov. 1957

Ewing (1928) stated that malignant disease of the superior maxilla and ethmoid bone accounted for 0.2 per cent of all malignant tumors in the body encountered in the Memorial Hospital, New York. Malignant disease of the ethmoid bone and maxilla is as grave a condition today as it was 125 years ago. The incidence is similar to that observed in other centers. The disease, by reason of its infrequency, demands a clinical alertness to interpret signs.

The surgical methods used by John Lizars (1829) and James Syme (1829) are reviewed, together with more recent literature. Fifteen case histories involving patients treated by the author between the years 1948 and 1956 are presented. The information suggests that recent nasal obstruction, unexplained epiphora, and facial pain, particularly maxillary neuralgia in edentulous patients, are useful early clinical signs. Epistaxis in the middle-aged patient, without vascular cause, should prompt investigation of the maxillary antrum. When the tumor is visible and palpable in the cheek, the prognosis with regard to permanent cure is generally poor. Facial pain, however, may reveal a carcinoma of the pituitary gland.

The use of tomograms to assist the operator in determining the size and extent of the tumor is of value.

Of the 15 patients, five were women and the other ten were men—farmers and laborers who did manual work. Two of the farmers ascribed their swellings to injuries; this may have been coincidental. Carcinoma was the commonest histological change noted.

Much of the terror of the operation has been removed by the success of modern anesthesia. The removal of the palate on the affected side, together with the ethmoid bone and lateral wall of the nose, is a humane and comforting operation to any patient with the disease in an advanced stage. Surgery is followed by deep roentgen-ray therapy.

Preoperative and postoperative prevention of pyogenic infections by administration of antibiotics in surgical elimination of malposed and impacted teeth or in complicated tooth extractions
(Ist eine prae- oder postoperative Antibiotikaprophylaxe der pyogenen Infektionen bei operativer Entfernung von verlagerten und retinierten Zähnen beziehungsweise schwierigen Extraktionen gerechtfertigt?)

H. Schwarzfischer and F. Gärtner.
Deut.Zahnärztebl. 11:861-863 Dec. 22, 1957

The advent of chemotherapy, especially of antibiotic and sulfonamide therapy, had an immense effect on diagnosis and treatment planning in dental practice.

One of the more important questions is whether specific antimicrobial agents should be applied. The decision is complicated by a number of factors, not the least of which is the attitude of the patient. The average patient expects, and frequently demands, antibiotic treatment without consideration whether the causative agent is susceptible to any of the available antibiotic agents.

Many dentists are selecting the easier course of prescribing or administrating supposedly specific treatment methods for practically all oral infections. Only when the infection is not terminated by therapy is serious consideration given to more accurate diagnostic measures. There are arguments to support such indiscriminate treatment, but in the opinion of most critical authors the arguments against such treatment outweigh those in favor.

A considerable portion of antimicrobial therapy used at present to prevent pyogenic infections in the surgical removal of malposed or impacted teeth or in complicated tooth extractions is unnecessary. More effective utilization of these drugs will result from a more careful selection of the individual patients and from a more accurate selection of the antibiotic agent.

Inadequate antimicrobial therapy may produce serious postoperative consequences by merely suppressing the pathogenic microorganism temporarily, thereby permitting the establishment of a chronic pyogenic infection which may leave permanent residual effects and may even result in death.

The management of pyogenic infection before and after oral surgery requires special consideration both diagnostically and therapeutically.

Treatment of chronic oral infection should be based on *in vitro* susceptibility tests, such as the paper disk susceptibility test, and should be planned in relation to any contemplated surgical procedure. The procedure of the paper disk susceptibility test is so simple that it can be performed in any laboratory capable of culturing clinical material. Because the strains within a single bacterial species vary widely and unpredictably, the susceptibility test is a valuable and often indispensable guide to successful preventive treatment of pyogenic infections in the oral cavity, either preoperatively or postoperatively, in surgical elimination of malposed or impacted teeth or in complicated extractions such as sectioning.

Goethestrasse 70, Munich 15, Germany

Prosthetic dentistry

Reinforced skeleton partial dentures

P. J. Hooton. *Austral. D.J.* 2:6-8 Feb. 1957

A described technic for making upper or lower partial skeleton dentures is not costly or time consuming, yet results in dentures strong enough to give lasting service without damage to gingival tissue and undue load on the abutment teeth. The dentures are made in acrylic resin on a stainless steel frame with any type of retainer, such as stainless steel wire, gold wire or cast retainers.

After the study model is made, the proximal undercuts are filled in as on a master model in cast denture work. In designing these dentures, the dentist first marks out the extent of the saddles and then joins them up by the bar or bars. Thus a pencil pattern of the denture is made on the model. The bar or bars should be kept well away from the gingival margins so that no soft tissue will be pressed up between the denture and the natural teeth. An anterior bar is not always used. The posterior bar is placed as far back as possible, and must never occupy any position anterior to the posterior sixth of the hard palate. It should be placed as far back in the middle line of the palate as the posterior border of a complete denture.

Occlusal rests must be used on all dentures of this type.

The frame for a maxillary skeleton partial denture is begun by bending the main wire, following the pencil outline on the model. This wire is half round or round, of 1.5 by 0.75 mm. gauge. The wire is bent to conform to the palate across the posterior line neatly, but not necessarily accurately. The wire should come into contact with the model at short intervals, so that no displacement will occur during the pressing of the acrylic resin. The wire is then tinned with the soldering iron, using pure tin and oxyphosphate flux. It is then waxed into position with sticky wax at the center of the bar. If stainless steel retainers are used, each retainer is bent so that at least one tail touches and bends along the main wire. That part of each retainer going into the acrylic resin is tinned to permit tacking (with the iron) the different wires together, and attaching them to the main wire. Only the smallest amount of tin is necessary to hold the parts together in the flask. The retainer is made of three separate wires, the tails of each wire going into the saddle area marked on the model (illustration, left).

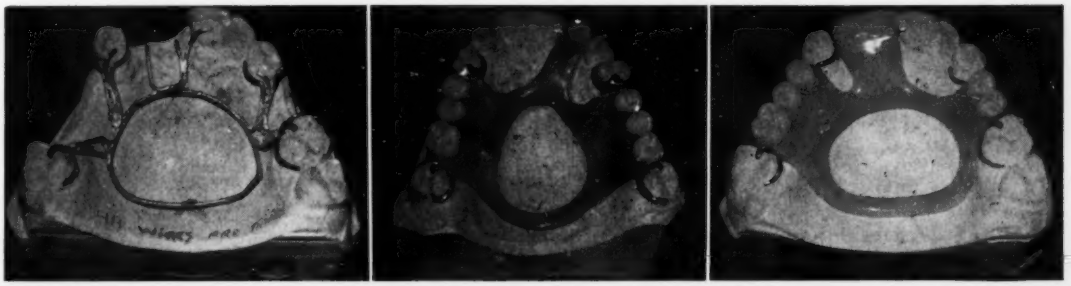
Stainless steel retainers are made from wire either half round of 1.0 by 0.75 mm. or 0.9 mm. round. The ends of the wire are hammered out flat, and this flat is trimmed and bent, care being taken not to make a sharp bend. The tail is now bent to come into contact with the lingual wire in the saddle area or with the main wire, and tinned and tacked into position.

After the whole frame is finished, wax is flowed under the wires, but is not allowed to flow past

Left: Frame ready for setting of teeth and waxing

Center: Waxed frame. Cast clasps are tacked to the main wire as shown in cutaway portion

Right: The completed denture



the marked area of the finished denture. Sheet wax is then warmed and placed over the whole surface of the model and the surplus is cut away, following the pencil outline of the denture (illustration, center).

The general procedure in setting up, waxing and flasking is followed, and the work is completed in the usual manner (illustration, right).

4 Moonbie Street, Summer Hill, New South Wales, Australia

Surgical intervention prior to insertion of complete dentures
(La chirurgie préprothétique dans l'édentation totale)

V. Popesco and N. Hermann. *Inform.dent.* 39:1085-1093 June 27, 1957

Statistical data accumulated at the Dental Clinic of the University of Bucharest, Romania, revealed that in a comparatively large number of instances in which the insertion of complete dentures was required, surgical intervention prior to denture construction was indicated.

These surgical interventions consisted not only of the routine extraction of teeth and roots but also of the removal of residues in regions of infection. If cysts were present, their extent and location usually indicated whether the restorative work should be performed before or after the surgical elimination. Sound treatment planning suggested surgical service prior to prosthetic service in most instances.

Alveolomerotomy, alveoloplasty or alveolotomy are required far more frequently prior to complete denture construction than in instances in which partial dentures are to be inserted. Before the construction of fixed dentures, surgical intervention usually is localized and limited to the removal of sharp spicules of bone and the rounding off of the alveolar process so that the healing ridge will be well formed.

Surgical reduction of parts of the ridge should be designed to increase the vertical space which is to be occupied by the pontics. When a comparatively short vertical space is present, the construction of fixed types of restorations is contraindicated. When such a condition is encountered, it is a simple matter to reduce the bone to any desired height at the same time as the multiple tooth extraction is performed. When the ridges are healed, surgical reduction should be carried out only after other methods appear impossible.

If localized regions are covered with hypertrophied mucous membrane and the hypertrophy is excessive, the tissue should be removed and a firm, well-rounded ridge established prior to denture construction. Localized eminences of osseous tissue should be smoothed and rounded properly. The excision of muscular attachments and of cicatricial tissue, if indicated, should also be performed prior to construction of complete dentures.

Examination of all conditions present in the oral cavity will disclose the type of surgical procedure the patient needs.

During the last decade, the progress made in the fields of plastic surgery and implantation as well as in the development of new and more effective antibiotics has decreased the risk of postoperative infection and made the utilization of surgical intervention prior to construction of complete dentures more advisable.

Clinique de Chirurgie bucco-maxillo-faciale, Bucharest, Romania

Impression taking in patients with vomiting reflexes
(Abdruck bei starkem Würgreiz)

L. Hupfauf. *Deut.Zahnärztebl.* 11:840 Dec. 8, 1957

The construction and insertion of partial or complete dentures for patients afflicted with extreme retching or vomiting reflexes cause difficulty.

In most instances, overexcitability of the vegetative or the sympathetic nervous system is the causative factor of uncontrollable vomiting. Impression taking in such instances should be carried out only under local anesthesia.

It is advisable that patients with vomiting or retching reflexes be treated by a physician prior to prosthetic service.

There are also patients who subconsciously object to the insertion of dentures. Such patients should be referred to a psychiatrist for treatment.

In patients with vomiting or retching reflexes, it is highly important that the inserted dentures

do not cause the slightest disturbance during articulation and mastication. It is advisable to relieve irritation and stress by shortening the palatal parts of the denture.

Patients will more readily become accustomed to their new dentures if they are advised to cover the dentures with a salve which contains a mild anesthetic.

Saarstrasse 21, Mainz, Germany

Unsuccessful dentures and their correction: a report of four cases

Romie H. Miller, Jr. *J.Missouri D.A.* 37:8-12 Nov. 1957

Among the reasons for unsuccessful dentures, for which the dentist is at fault, are the following: inadequate chair time, faulty laboratory technics, improper centric relation, overextended or underextended periphery, lack of proper adjustments, lack of understanding of patient's personality, overlooking of patient's emotional needs, and failure to consider the esthetic requirements. Four case reports illustrate some frequent errors.

A 52 year old man was referred by a neurologist because of frontal, ocular, maxillary and mastoid pain. The patient had been edentulous for ten years and was wearing only an upper complete denture. He said he did not wear his lower denture because he was always conscious of it and that he constantly clenched his teeth, making the gums sore. Measurements revealed that the distance from nasion to gnathion, with the lower ridge in occlusion with the upper teeth, was 118 mm. The rest position measured 125 mm. When the lower denture was in occlusion with the upper, the measurement was 128 mm. Thus, the dentures had been constructed to a centric position with an interalveolar distance 3 mm. greater than the rest position. New dentures were constructed. The centric relation was recorded at 123 mm. and milling reduced this to 122 mm. The patient then had a sufficient freeway space of 3 mm. After several adjustments, both dentures were worn with comfort and the pain was relieved.

A 47 year old man complained that his complete dentures were unsatisfactory esthetically. The upper incisors were short and the posterior teeth long, so that the occlusal plane sloped downward posteriorly. Molar support was inadequate and the lower denture unstable.

When the lower impression was taken, additional compound had to be used in the incisal and retromolar regions to stabilize the impression and to prevent its rocking back and forth. When centric relation was established and the casts articulated, the maxillary ridge appeared to incline downward and backward. Although there was adequate space for the teeth, the unfavorable slope of the upper ridge, unless taken into consideration, would cause a repetition of the unesthetic appearance. The longest upper incisors and both long and short upper posterior molds were selected. The lower teeth were of medium length. The upper incisors were set well down and away from the ridge. Long upper bicuspids and short molars were set, and the second molars were ground to fit the ridge. The lower teeth were set accordingly.

A 51 year old man complained that his upper complete denture was unstable. He still had his natural lower incisors, cuspids and left bicuspids, and complained that his lower partial denture was uncomfortable because the lingual bar cut into the soft tissue.

Because of constant occlusal pressure there was resorption of the lower ridge and migration of the remaining lower teeth, making the lower partial denture nonfunctional. A disclosing wax test revealed that the upper denture was ill-fitting and that the post-dam area was about 2 mm. away from the soft tissue.

New impressions were taken. In processing the dentures, the time and temperature formula was altered to reduce dimensional change to a minimum. The dentures were processed at 160° F. for six hours, then allowed to cool slowly and evenly. When the dentures were seated the adjustment of the lower partial denture was minor and routine. The upper denture was quite stable because of adequate peripheral and post-dam seals. Apparently the old denture had been bench-cooled on a cold day and had warped.

A 74 year old woman complained of pain and soreness for three years in both temporomandibular joints, ears and maxillary and temporal regions. She had worn complete dentures for 30 years.

Examination revealed apparently healthy denture-bearing areas. The dentures appeared serviceable except that the occlusion was heavy in the incisor region and very light in the molar region. The incisors were spot ground to bring the molars into occlusion. It soon became evident that the incisors would have to be ground off past the pins before the molars could be brought into proper occlusion. Impressions for new dentures were taken.

In 30 years of wearing dentures, there had been extensive resorption of the ridges, pressure and damage in the temporomandibular joints with subsequent condylar displacement and considerable closure of the bite. Apparently, when the dentures were reconstructed previously, molar support was not considered and temporomandibular joint changes became progressive. The new dentures were inserted and within a week the patient was comfortable and able to masticate efficiently.

7734 Maryland Avenue, Clayton 5, Mo.

Pantothenic acid medication in inflammation of the oral mucosa beneath removable dentures
(Über "Bepanthen" Medikation bei Schleimhautaffektionen unter herausnehmbaren Zahnersatz)

Werner Reither. *Deut.zahnärztl.Zschr.* 12:1100-1107 Aug. 15, 1957

Pantothenic acid, a component of the vitamin B complex, has been used with success in medical and dental practice.

Pantothenic acid, a nitrogenous hydroxy acid which is soluble in water and hardly soluble in oil, occurs in animal and plant tissues. Pantothenic acid derivatives sold commercially are prepared by synthesis. The German preparations Bepanthen and Bepanthen salve are almost identical to the American preparations Panthenol and Panthoderm Cream.

Although R. J. Williams recognized in 1933 the existence of pantothenic acid as a nutritive component in yeast, its role in the nutrition of animals and human beings was not demonstrated until later.

In the absence of pantothenic acid in their diet, experimental animals fail to grow, show lesions on the skin and mucous membrane and premature graying of hair. A significant function of this vitamin was discovered in 1947 by F. Lipman in his studies on the coenzyme A in which pantothenic acid occurs in connection with adenylic acid and thiothiamine. In this form pantothenic acid reacts with a variety of metabolic intermediates, enabling them to undergo degradative or synthetic changes.

In the diet of experimental animals, more pantothenic acid is required than other vitamins. A rat, for example, needs about ten times more pantothenic acid than thiamine or pyridoxine.

Medication of calcium pantothenate resulted in healing of some forms of glossitis and cheilosis, even in instances in which other components of the vitamin B complex were ineffective.

Because of reports which described success in the treatment of affections of the oral mucosa through administration of pantothenic acid as sodium or calcium salts, the effects of this vitamin in the treatment of inflammation of the mucous membrane appearing beneath removable dentures were studied at the Dental Clinic of the University of Munich, Germany.

It was established that pantothenic acid had definite curative effects in acute and chronic ulcerations caused by pressure after elimination of the irritative factors in dentures.

The salve was used successfully for acceleration of the epithelization of wounds in the oral cavity and for softening of the cicatricial tissues. An almost immediate improvement in the condition of inflammations beneath immediate dentures was observed.

For the treatment of various irritations of the oral mucosa, pantothenic acid in a water-miscible cream or in solution can be recommended.

Goethestrasse 70, Munich 15, Germany

Orthodontics

The congenitally absent premolar problem

Joseph R. Valinoti, Jr. *Angle Orthodont.* 28:36-46 Jan. 1958

To determine the approximate incidence of missing bicuspids, full-mouth roentgenograms of 300 consecutive patients (124 males and 176 females) ranging in age from 7 to 25 years were examined. Twenty patients (6.6 per cent) had 29 congenitally absent second bicuspids, predominantly in the mandible.

The treatment alternatives are replacement with a prosthesis and mechanical closure of the space. The chief advantage of a prosthesis is that it is a quick solution. The disadvantages are as follows:

1. A fixed bridge requires complete or partial coverage of at least two abutment teeth with removal of considerable tooth structure.
2. The patient must wear the prosthesis for the life of his dentition.
3. The prosthesis may be unsatisfactory.

Space closure with appliances avoids these disadvantages. A better result is obtained if correction of the occlusion warrants the extraction of an opposing bicuspid; the prospects of success are even greater if bilateral treatment is used.

An analysis of the malocclusion as a whole will dictate the strategy of appliance therapy. The bicuspid space may be closed by the mesial movement of molars, the distal movement of bicuspids and cuspids followed by the lingual movement of incisors, or by combinations of these movements.

Bands are placed on the first molar, first bicuspid and cuspid. Second molars are banded if the posterior segment is desired as anchorage. If incisors are in good alignment, are not procumbent, and if mesial molar movement is the objective, the incisors are banded immediately. The most distal band carries an edgewise tube; other bands carry double width brackets.

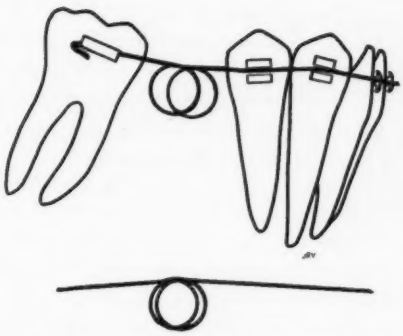


Figure 1 Above: Round wire arch appliance with double loop. Below: Wire before insertion

Uniform tube and bracket height from cusp summits and incisal edges in the same arch is an accepted principle of the edgewise technic. The lower first bicuspid bracket, however, in most instances must be placed further gingivally than the other attachments in order to elevate this tooth. The summit of the buccal cusp of the first bicuspid is reduced slightly to harmonize with adjacent teeth.

Successive round wire arches are placed for leveling, for correcting rotations and principally for uprighting. A double round loop is incorporated in the center of the space (Fig. 1). The action is gentle in the first phases of treatment. The loop is activated slightly and adjustments are made at intervals of not less than four weeks.

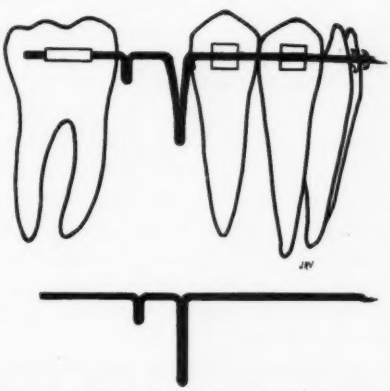


Figure 2 Above: Rectangular wire arch with Bull loop and tieback spur. Below: Wire before insertion

A rectangular wire (0.021 by 0.025) into which has been incorporated a Bull loop and tie-back spur (Fig. 2) next is placed without activating the loop. Later the loop is opened 1 mm. by tying it back at intervals of not less than three weeks. More frequent activation results in loss of anchorage and unfavorable tissue reactions.

Intermaxillary elastics of the Class II or Class III type may be used either to aid the desired movement in one segment or to prevent undesired movement in another segment.

When the crowns are in contact and roentgenograms reveal that the roots are not parallel, the molar may be tipped back and the bicuspid tipped forward while proximal contact is actively maintained.

If the second molar has not been banded, it usually will be mesially inclined. A slight mesial inclination is normal and actually may help maintain proximal contacts throughout the arch. If the mesial inclination is excessive, it may be corrected.

Six case reports illustrate the technic; treatment time varied from 17 to 36 months.

Manhasset Medical Center, Manhasset, N.Y.

Selective grinding in orthodontic practice
(Selektivo brušenje zuba)

B. Kuljača. *Zobozdrav.vest.* 12:138-144
July-Sept. 1957

Selective grinding to obtain functional articulation still is used too infrequently in dental practice. Although selective grinding is not without hazards, so are many other procedures that are accepted and used without question.

Selective grinding should be carried out only after it has been determined exactly where to grind. Carbon paper is used to indicate the exact points of occlusal contact. The carbonized spots are ground and again marked to be reground, and this procedure is repeated until the previously traumatized region is entirely relieved. Teeth that have been treated correctly for traumatic occlusion by selective grinding will never have a mutilated form but will appear as if the alteration in form had been brought about by natural attrition.

Perhaps a serious obstacle to the more frequent use of selective grinding is the misconception that this procedure is extremely painful to the patient, technically difficult to perform, and that it invariably requires the employment of a complicated apparatus such as an adjustable articulator. Although the use of such an apparatus is required in the orthodontic treatment of patients with an extreme disturbance of articulation and occlusion, it is not essential for selective grinding of teeth where no complication exists.

Selective grinding should never be carried out beyond the point where sensitivity occurs. This threshold is reached much sooner in children than in middle-aged or elderly patients.

Prior to selective grinding, clinical examinations should be made to determine whether the following conditions are present: (1) teeth in a premature contact; (2) teeth in traumatic relation during articulation or occlusion, and (3) teeth in a potentially traumatic relationship.

These conditions can be determined by the following procedures:

1. By palpation. The detection of tooth mobility is obtained by the orthodontist's fingers placed over the buccal aspects of the upper teeth during closure into centric occlusion.

2. By inspection. Tooth mobility is detected visually during the excursive movements of the jaws.

3. By ausculation. The sounds made on closure frequently are duplicated if there is a premature contact which causes the teeth to slide rapidly from the initial to the terminal relation. In instances in which several teeth are loose or are in traumatic occlusion, no sharp snapping sounds occur but indistinct muffled noises.

4. By percussion. This is carried out at a right angle to the long axis of the teeth. If the supporting tissues are healthy, a sharp resonant sound is heard. Tooth mobility caused by premature contacts, alveolar or cementum resorption and deep pocket formation decreases the percussion note. Sometimes crackling or clicking noises are perceptible. Cavities and tooth restorations also may influence the percussion note.

When study models are used, they should be mounted in duplicate on adjustable articulators. The registrations required are: (1) face-bow registration to determine the relation between upper teeth and condylar movements; (2) centric rela-

tion registration with jaws in rest position; (3) protrusive relation registration, and (4) lateral relation registration.

The technic of selective grinding requires only two straight handpiece diamond stones, similarly shaped carborundum stones and abrasive rubber disks. A motor capable of achieving from 8,000 to 10,000 rpm, and red and blue articulation paper, are necessary.

Selective grinding in orthodontic practice is very different from grinding all tooth surfaces flat, a procedure which would inevitably produce an unfavorable occlusion. Selective grinding is a rational procedure designed to facilitate maximal function, to eliminate excessive stress and to permit a freely sliding articulation. It is one of the many methods used in the prevention and treatment of periodontal disease. Indiscriminate grinding is damaging to tooth structures and in addition may create an even more traumatic condition than had existed.

Narodnog Zdravlja, Belgrade, Yugoslavia

Construction of cephalometrically correct models for orthodontic diagnosis with the aid of a gnathometer
(Herstellung orientierter Modelle für diagnostische Zwecke in der Orthodontie mit einem neuen Gnathometer)

Eugen Kozma. *Deut.zahnärztl.Zschr.* 12:1189-1193 Sept. 1, 1957

Orthodontic diagnosis and treatment planning can be facilitated if the orthodontist has at his disposal cephalometrically correct models on which even minor deviations can be determined. The customary anatomic models cannot represent slight increases or decreases in vertical dimension accurately. The correct evaluation of tridimensional deviations from the normal, especially facial asymmetry and malocclusion, is possible only with the aid of cephalometrically accurate models.

The use of a recently introduced gnathometer, which measures the forces exerted during masticatory function, facilitates the construction of cephalometrically correct models. These models indicate the topography of the Frankfort horizontal plane, orbital plane, preauricular plane and other cephalometric points based on gnathodynamics, gnathography and gnathostatics. The advantage of the gnathometer is its simplicity in design and manipulation which makes the use of other measuring devices unnecessary.

The gnathometer consists of three parts: (1) a dial with an angle between the pointing needles (102 degrees); (2) a wax-bite carrier which is adjustable to each individual patient, and (3) an indicator which permits the fixation of the wax-bite carrier.

The working procedure is as follows: (1) customary taking of the wax bite and adjustment of the gnathometer directly on the patient to obtain the cephalometric data; (2) recording of planes and points on the wax-bite; (3) transferring the established orbital and tragal point to a graph paper squared in millimeters, and drawing the diagnostically significant cephalometric trapeziform diagram by connecting the orbital and tragal points; (4) covering the graph paper with a thin glass plate on which the flasks for the upper model are positioned; (5) loosening of the pointers in the dial which are moved laterally until the prepared model, pasted to the wax-bite, is correctly adjusted and the tragal pointer determines the orbital and tragal points; (6) constructing the upper model in the customary manner, and (7) repeating the procedure to construct the lower model.

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Periodontics

Treatment of infectious gingivostomatitis and membranous stomatitis with Terramycin mouthwash

Walter C. Stout. *J.Periodont.* 28:314-315 Oct. 1957

Infectious gingivostomatitis and membranous stomatitis are acute infections of the oral mucosa and gingivae characterized by sudden onset, acute inflammation, bleeding, exudation, pain and fetor oris. Lymphadenopathy may be present, accompanied by fever up to 102° or 103° F.

The oral hygiene of patients with either of these infections usually suggests good home care and regular dental attention, unlike that of patients with oral sepsis and necrotizing ulcerative gingivitis. Care should be exercised in making a differential diagnosis. Many operators initiate scaling, curettage and prophylactic treatment at the first appointment in instances of oral sepsis and necrotizing ulcerative gingivitis, but these treatments are contraindicated in infectious gingivostomatitis and membranous stomatitis until complete remission of the infection.

Stress, debilitation, fatigue and overindulgence are predisposing factors for infectious gingivostomatitis and membranous stomatitis. Almost every patient examined in this study gave a history including one or more of these factors.

In the microscopic examination large numbers of *Streptococcus viridans* and *Str. hemolyticus* were found.

In 18 months 50 patients with infectious gingivostomatitis were treated successfully, using 250 mg. of oxytetracycline in a suspension with 4 tablespoons of warm water as a two minute rinse after each meal and before retiring. Collings and Stout (1954) described this technic in the treatment of solitary and recurrent aphthae.

The only other instructions to the patient were to spit out the solution after rinsing and to swallow any residue, to maintain a bland liquid diet for 24 hours and a soft diet for three days, to discard the toothbrush in use and to resume brushing when instructed.

Within 24 hours 44 of the 50 patients reported less pain and reduced sensitivity. The remaining six patients described similar results within 48 hours. Treatment was discontinued after 72 hours except for four patients, for whom it was necessary to continue the rinse for four to seven days.

In six patients with membranous stomatitis similarly treated, five described a decrease in sensitivity and pain after four rinses and the remaining patient was more comfortable after two days of treatment.

The action of the oxytetracycline mouthwash also was tested in three patients with severe chemical burns in the oral cavity and in one patient who had sustained a severe reaction to a self-curing acrylic reliner in an upper denture. Diminished pain and lessened sensitivity were noted in all four patients within 24 hours.

Six patients with necrotizing ulcerative gingivitis were treated similarly. All six reported less pain after one day; after three days of treatment there was no sign of any ulceration.

The treatment is rapid, nontoxic, soothing and without systemic complications. The rapid analgesic effect is appreciated by the patient.

College of Dentistry, Baylor University, Dallas, Texas

Diagnosis and prognosis in periodontal disease

Allan N. Arvins. *J.A.D.A.* 55:621-625 Nov. 1957

Many signs lead to the detection of early periodontal disease, but one must "think periodontally" to see them.

In roentgenograms, changes in the alveolar crest are seen early in the disease. The cortical plate or lamina dura disappears, and the area immediately below appears radiolucent. Thickening of the periodontal space as a result of trauma first appears close to the marginal crests and continues, involving the entire periodontal membrane. The level of the interproximal crest is an

important indication of the degree of periodontal involvement. Normally, the crest is found near the cementoenamel junction, perhaps 1 mm. below.

Perhaps the most reliable and easily discernible clinical sign of periodontal disease is tooth mobility. The ends of rigid instruments should be used for testing, with the tooth being rocked between them. Movement of the slightest amount greater than normal is classified as no. 1. No. 2 mobility is that amount of movement which allows the crown to move 1 mm. in any direction. No. 3 mobility permits the tooth to move more than 1 mm. in any direction and also its alveolus to be rotated or depressed.

The amount of bone around a tooth as observed in the roentgenograms may have no relation to the degree of mobility.

Variation from the normal pink color of the gingiva usually is a sign that disease is present. An early sign is marginal redness due to traumatic occlusion, subgingival calculus or dietary deficiency. Suppuration is a sign of a more advanced disease; pus can be elicited by "milking" the gingiva (exerting a stroking pressure on the gingiva in an apical to an occlusal direction).

Occlusal trauma is a common etiologic factor in periodontal disease. Frequently, esthetically poor anterior alignment will give a clue to the presence of malocclusion. An overly long anterior tooth or one which protrudes, and diastemas—such simple signs as these indicate a need for investigation.

In determining prognosis the following factors should be considered:

1. Extent of the pocket. Pockets which involve the trifurcations of the upper molars usually mean that these teeth cannot be expected to be serviceable. Deep pockets close to the apex of the tooth indicate a hopeless situation.

2. Alveolar bone support. The amount, distribution and type of bone are important prognostic factors. At least one half the bone must remain around a tooth for the prognosis to be favorable.

3. Mobility. The prognosis for teeth which evidence no. 3 mobility generally is hopeless and the tooth should be extracted.

4. The number of teeth remaining. A sufficient number of teeth must remain to carry the expected load.

5. Distribution of remaining teeth.

6. Age. Paradoxically, the younger the patient the poorer the prognosis.

7. Health. Systemic diseases delay response to treatment.

8. Cooperation of the patient. The best efforts go for naught if the patient does not cooperate.

Treatment is directed toward the removal of causes of periodontal disease which involves teeth that have the ability to respond.

College of Dentistry, New York University, New York, N.Y.

Diseases of the gingivae: influence of puberty, menstruation, pregnancy and climacteric

(Erkrankungen des Zahnfleisches: Einfluss von Pubertät, Menstruation, Schwangerschaft und Klimakterium)

H. J. Kutzleb. *Umschau* 57:371-372
June 15, 1957

The dependency of the female organism on hormonal secretions into the body fluids becomes obvious during such periods as puberty, menstruation, pregnancy and climacteric.

Subacute gingivitis occasionally appears during pregnancy or immediately prior to menstruation. Acute gingivitis or simple periodontal disease may occur during pregnancy.

Gonadal hormones injected in female monkeys produced hyperplastic changes in gingival tissues; there was hyperplasia of the connective tissue and hyperkeratinization of the epithelial tissue.

Similar gingival alterations, occurring in pregnant women, probably are due to various factors, the most prominent being a diminished utilization of estrogen or a modification of the estrogen metabolism which is caused by the increased amount of progesterone produced. Other causative factors may be the comparatively large amount of chorionic gonadotropin present or the metabolic action of other hormones.

Of 427 pregnant women examined, 230 had gingivitis and of these, 26 had serious complications. Hormonal factors can be regarded as the primary cause and the systemic disturbances as conditioning agents.

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Anatomy

Relation between the facial skeleton and the profile

(L'orientamento dello
scheleto facciale e il profilo)

Oscar Hoffer. *Rass.internaz.stomat.prat.* 8:62-72 April-June 1957

The relation existing between the facial skeleton and the profile can be determined by an analysis of the factors which compose the craniofacial form and which consist of the following:

1. The cranial plane is formed by the union of the apex of the sphenoid bone with the anterior ethmoidal foramen. The individually varying position of both structures is subordinate to the angle formed by the lamina cribrosa and the sphenoid bone with the vertex at the sphenofrontal suture. In teleroentgenograms, the anterior ethmoidal foramen appears transilluminated by ethmoid cells directly in the path of the lamina cribrosa. There it meets the vertical projection of the muscles of the temporal fossa and fascia and those of the zygomatic bone anterior to the temporal process and in the vicinity of the maxillary suture.

2. The lower perpendicular plane of the anterior ethmoidal foramen (gnathic incidence axis) passes through the anterior palatine canal.

3. The line running from the cranial plane to the anterior bone structure lies in an angle of 85+ degrees and determines the profile line.

The extension of the cranial and the lower anterior planes running in an anteroposterior direction determines the facial inclination. The establishment of these planes by teleroentgenography is especially important for orthodontic treatment planning (Dujsens and A. M. Schwarz).

The individual position of the sella turcica, a transverse depression in the posterior portion of the upper surface of the sphenoid bone, is subject to morphologic variations.

In teleroentgenograms, the individually varying outlines of the processes of the upper jaw and their delineations within the boundaries of eminences on the outer edges of the external pterygoid plate cannot be used for exact determination of the spinal plane. These outlines, even if recognizable, are misleading in determining racial or ethnic variations such as difference in volume or inclination of the anterior nasal spine or of an abnormally low position of the posterior spine. For proper designation of the anterior part of the palatal process, which in teleroentgenograms appears near the anterior region of the nasal opening, of the anterior nasal spine where it passes to the alveolar region, of the alveolar bone and the teeth, the term "zone of variables" (zona variabilis) is proposed. This term indicates the maximum of variability in formation and the possibility of various deformations to which this region is predisposed.

In teleroentgenograms and in craniofacial diagrams, the spinal plane can be determined by measuring the extension of the maxillary base to the spinous process and by establishing the relation existing between the nasospinale and the highest point of the curvature of the palatal process.

For "spinal plane," however, the adoption of one of the following terms, either "spinopalatal plane" or "A. M. Schwarz's plane" is suggested.

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The extra-osseous innervation of the gingivae

Dipya Mongkollugsana and Linden F. Edwards. *J.D.Res.* 36:516-524 Aug. 1957

Ten standard textbooks of human anatomy and five textbooks of local anesthesia were examined to ascertain what information they provided concerning the nerve supply of the gingivae. Lack of agreement was noted, and none of the books contained complete information concerning the innervation of the gingivae. A study was undertaken to determine by gross dissection the extraosseous nerve supply of the maxillary and mandibular gingivae. By "extraosseous" is meant those nerves situated on the buccolabial and palatolingual aspects of the maxilla and mandible

as opposed to the alveolar nerves which are intraosseous. The following conclusions were reached:

1. The palatal gingiva of the maxillary incisors and cuspids is supplied by the nasopalatine nerve.

2. The palatal gingiva of the maxillary bicuspids and molars is supplied by the anterior palatine nerve.

3. The labial gingiva of the maxillary incisors and cuspids is supplied by the labial branch of the infraorbital nerve.

4. The buccal gingiva of the maxillary bicuspids and molars is supplied by the posterior superior alveolar nerve.

5. The lingual gingiva of all the mandibular teeth is supplied by the lingual nerve.

6. The labial gingiva of the mandibular incisors and cuspids, including in some instances the first and even the second bicuspid, is supplied by the mental nerve.

7. The buccal gingiva of the mandibular molars and sometimes the second and even the first bicuspid is supplied by the long buccinator nerve.

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A study of the distribution of nerves in human teeth

Robert Rapp, J. K. Avery and R. A. Rector.
J.Canad.D.A. 23:447-453 Aug. 1957

Although the problem of pain consistently has confronted the dental profession, research has yet to demonstrate the basis of the extreme sensitivity of the dental structures.

An investigation was made of the distribution of nerves and neural endings in noncarious, permanent human teeth. After a trial of several methods of impregnation by silver, the Powers' modification of the Romanes stain was selected as most suitable.

Large neural trunks were traced from the apical foramens to the pulpal chamber where they branched to form a subodontoblastic network of fibers. Most neurofibrils passed from this network through the cell-free zone of Weil where they lost their myelin sheaths and terminated among the odontoblasts. No neural endings were noted on the odontoblasts or on their protoplasmic processes. A few fibers were found to arise from the subodontoblastic network and enter the predentin for a short distance. Some of these fibers followed an intratubular course whereas others appeared to be positioned in the matrix of the predentin between the tubules. The terminal portions of the neurofibrils showed evidence of looping back toward the pulpal tissue. Some fibers terminated in bulblike endings, whereas others terminated in free endings.

The existence of a plexus of Raschkow has been disputed. The present study indicates that such a network of fibers beneath the zone of Weil does exist.

The cell-free layer of Weil also is the subject of varying interpretation. The present study indicates that the layer of Weil is a narrow zone, free of cells and containing a network of fine fibers situated subjacent to the odontoblastic layer. A zone rich in cells borders the layer of Weil pulpally and next to this layer is the parietal layer of neurofibrils.

The question arises regarding the process by which the neurofibrils become incorporated in the predentin and the dentin. Comparison of the teeth from patients 10 to 60 years old indicated that more nerves were present in the predentin of the older teeth. A possible explanation is that the neurofibrils, which formerly existed among the odontoblasts, were included in the predentin as it was laid down in a pulpal direction.

It is possible that the dentin contains more nerves than are observed, but that the neurofibrils become masked because of the structural density of the dentin. The explanation of the extreme sensitivity of dentin still is undetermined. It is improbable that the relatively few neurofibrils observed in the predentin can account for the extreme sensory perception often encountered.

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Public health dentistry

Dentistry in Israel: the Ministry of Health and dental health

K. A. Rosenzweig. *Refuat Hashinaim.* 10:25-29 Aug. 1957

The Mandatory Government of Palestine paid no attention to dental health, individual or public, but did license dentists. With the establishment of Israel, a Ministry of Health was organized but with no dentist. The Ministry, on request from different quarters, especially from dentists, did establish a dental service for the inmates of mental and tuberculosis hospitals, financed a survey on dental health, and provided funds for a dental school.

In 1954 a dentist was nominated to the Advisory Board of Health and a committee for dental health was appointed, with a subcommittee on problems of fluoridation. In 1955 the author was appointed adviser on dental health and was given a scholarship to study dental public health at the University of Michigan. After his return a program was planned with the long-range objectives of introducing preventive methods in public health dentistry and making dental care available to the whole population, particularly to children, those living in rural settlements and minority groups.

Plans have been made to have a controlled demonstration of fluoridation in Yagur, with the cooperation of the departments of nutrition and of preventive medicine of the Hebrew University. A uniform treatment chart has been developed for use in all clinics for school children. A sample survey on the oral health of school children has been carried out, and a census of dental clinics for school children is being conducted.

The Ministry of Health helps local authorities establish dental care plans for school children by loaning equipment, supplying instruction and supervision and, if necessary, appropriating funds. Efforts are being made to attract dentists from abroad to work part-time in outlying communities and to settle there and make their services as private dentists available to the adult population as well. Clinics have been established in Beer Sheva, Lod, Ramlah, Rishon Letzion, Ashkelon, Lakhish, Eilat and Safet.

The School of Dentistry of the Hebrew University and Hadassah was established in 1953. The first class, now in its fourth year of studies, has 12 students; the second class, 13; the third, 11, and the fourth class, 18 students. When permanent premises in the New Medical Center near Ein-Karem are completed, classes may be increased from a maximum of 18 to 25, this being the number of young dentists which Israel will require yearly to replace veterans who have reached the age of retirement.

The School of Dentistry is a joint project of the Hebrew University and Hadassah (an organization of Jewish women in the United States devoted chiefly to the maintenance of schools and hospitals in Palestine). The University covers the budget for all preclinical studies, whereas Hadassah finances the clinical studies. The Alpha Omega fraternity, with members in the United States and Canada, has contributed funds toward the building of the School of Dentistry at the New Medical Center in Ein-Karem, near Jerusalem; has donated instruments and equipment to the school clinics; has established students' loan funds and scholarship funds; has collected dental books, and so forth. In almost every country branches of the World Federation for an Israel Dental School exist.

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Dental health survey of medical students

T. N. Chawla and K. P. Chaudhry. *J.All India D.A.* 29:165-171 Aug. 1957

A dental health survey was made of the 476 men and 139 women between the ages of 18 to 22 who are students of the King George's Medical College, Lucknow.

Of the 615 students, 80.41 per cent clean their teeth with a toothbrush and a proprietary dentifrice; 14.85 use a finger to rub a homemade dentifrice on the teeth, and 4.72 use datun—a

fresh twig chewed to a brush head which is rubbed on the teeth without any dentifrice.

Calculus deposits were observed in 61.98 per cent of the men and 82.74 per cent of the women, the combined percentage being 72.36.

Gingivitis was observed in 84.90 per cent of the men and 91.37 per cent of the women, the combined percentage being 88.13.

Of the 476 men, 255 (52.20 per cent) had one or more carious teeth. Of the 139 women, 83 (59.71 per cent) had one or more carious teeth.

Malocclusion was more prevalent among women than men. It was noted that 40.79 per cent of the subjects had no erupted third molars.

Although the size of the sample was too small to represent the status of oral health in the educated rural middle class, it demonstrated the pathetic neglect of dental health in these medical students.

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Anxiety and dental caries

G. T. Phipps and F. L. Marcuse. *J.D.Res.* 36:862-865 Dec. 1957

The theory that an emotional factor plays a role in dental decay holds that emotional changes affect glandular activity and that such altered glandular activity may in turn change the chemistry of the saliva and be conducive to greater caries activity.

The relation, if any, between manifest anxiety as measured by the Taylor anxiety scale and caries as indicated by the DMF surface index, was investigated in 105 new students registering at the State College of Washington in September 1955. Subjects also completed a questionnaire on age, sex, urban-rural residence, father's socioeconomic status, oral hygiene practices, and sugar consumption.

Results indicated no differences even approaching significance between high-anxiety and low-anxiety groups on such variables as those studied through the questionnaire. Results also indicated that there is no significant difference in the mean pH of the saliva or in the mean DMF score of a group of subjects with high-anxiety scores and a group of subjects with low-anxiety scores.

Either the Taylor anxiety scale does not discriminate anxious from nonanxious subjects, or anxiety, as measured, is not related to the pH of saliva or to dental decay as measured by the DMF score.

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Bitewing radiograph programs in elementary schools

A. H. Trithart. *Bul.Am.A.Pub.Health Den.* 17:9-12 Aug. 1957

During a two year period from July 1, 1954, to July 1, 1956, the dental division of the Tennessee Department of Public Health conducted 20 bitewing roentgenographic programs in the state. The programs were undertaken at the request of local dentists and local health departments, and included about 2,000 children. The programs were carried out in schools with children usually in grades three through six. Equipment consisted of a portable dental chair, portable x-ray machine, lead screen and two boxes lined with lead. A vacant classroom, or any area of about 100 square feet of floor space with an outside wall, was used. The x-ray machine was set up so that the roentgen rays were directed toward the outside wall. The waiting children and the operator were protected by the lead screen. With proper organization, about 100 children could be accommodated in a school day by either a dentist or dental hygienist.

The films were developed and mounted in three or four hours by the dental hygienist. The children were asked to bring the bitewing roentgenograms to their dentists. Previously, the dentists of the community had been requested to sign the roentgenograms when treatment was completed and to return the roentgenograms to the children. In turn, the children returned the signed roentgenograms to their teachers, for attachment to each child's cumulative health record.

At the time the films were returned to the children, a dental health education program was conducted in each classroom. Roentgenographic slides and blackboard drawings were used to interpret roentgenographic landmarks to the children. Dental health motion pictures which emphasized the importance of early and frequent dental examinations were shown. The children

were invited to ask questions. The dental education program required from 30 to 40 minutes in each classroom.

The primary purpose of the program was to stimulate children to visit the dentist. To determine the effectiveness of the bitewing roentgenographic program, results in six communities in west Tennessee were evaluated. Of 583 children, 211 (48 per cent) had visited the dentist. No attempt was made to determine whether all children involved were in need of dental treatment, or whether socioeconomic factors prevented some children from obtaining dental treatment. The study showed that success of the program depended to a large extent on sufficient dental manpower being available to care for the anticipated dental demands. The program required about 12 hours for each 100 children.

Bitewing roentgenographic programs are a fairly effective method of stimulating child visits to the dentist with a minimum of time and effort by either public health dentists or dental hygienists.

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A possible mechanism of the anti-caries action of fluoride

G. N. Jenkins. *Odont.Revy* 8:222-224 No. 3, 1957

Osborn (1941) observed that organic phosphates possess the property of reducing the solubility of teeth when incubated with saliva and carbohydrate. Unpublished observations in the author's laboratory have confirmed this report and have shown also that organic phosphates are effective in reducing the solubility of teeth (or calcium phosphate) when shaken with acid buffers. The effect, therefore, is not dependent on the release of phosphate ions by salivary enzymes.

It might be expected that phosphoglycerates would accumulate in plaque if fluoride acts as an inhibitor of glycolytic enzymes. The author attempted to detect phosphoglyceric acid in saliva incubated with glucose and levels of fluoride up to 10 ppm, which conceivably might be present on the inner surface of the plaque. The results have been negative so far, but this does not disprove the hypothesis conclusively since it is difficult to reproduce in the test tube the conditions in the plaque.

Newcastle upon Tyne, Northumberland, England

Trip to Ecuador for dental studies

(Mi viaje de estudios odontológicos en Ecuador)

T. Dobrowsky. *Tribuna odont., Buenos Aires* 41:73 March-April 1957

At the present time the population of Ecuador is made up of different racial groups (Whites, Indians, Mestigos and Negroes). The eating habits and the conditions of the teeth differ in the various racial groups. The author visited the Ethnographic Institute of the University of Quito and other ethnographic centers where large collections of craniums from the era before Columbus are housed. Some of the craniums have good teeth. He visited the Ecuadorian jungles by airplane, stopping first in Shell Mera and then at the headquarters of Sucúa. Shell Mera is an Ecuadorian military post near the territory of the Auca Indians (who in 1956 assassinated five American missionaries).

Sucúa is near the Peruvian border and also near the territory of the Jíbaro Indians. The teeth of an Aucan young woman and of 211 Jíbaro Indians were examined here. These Indians are pagans and polygamists. They are good head hunters. They transform the heads of their enemies into "tzantzas" (shrunken heads) by the use of a wild plant. The diet of the Jíbaro Indians consists of "yuca" (a root similar to a potato), bananas and wild fowl.

These Indians do not know bread. They take sugar in the form of a juice and they drink alcohol in "chicha" (a fermented beverage). The Jíbaro Indians have many tropical diseases. They wash their mouths after meals and often they chew the leaves or berries of wild shrubs ("piyú" or "nashumanbi") which prevent caries. When the berries are chewed two or three times, the teeth become a blackish color which lasts for five or six months during which times caries does not occur.

The chewing of these plants is forbidden in Catholic missions and this fact enabled the author

to make a study of the effects of the plants on the prevention of caries. The study showed that the method used by these Indians, of covering their teeth with a protective film by chewing the leaves or berries of plants, gives far better results than the use of brush and dentifrices.

An American researcher is working in Ecuador with the plants that the Jíbaro Indians use for shrinking the heads of their victims. He is trying to find out if the use of these plants may constitute a cure for cancer.

The author sent a fair amount of the leaves and berries that are used for the prevention of caries by the Jíbaro Indians to the German Institute for Research on Caries of the Johannes Gutenberg University in Mayence where studies are now in progress to ascertain the properties of the plants.

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Dental epidemiology in Malaya

F. McCombie. *J.Canad.D.A.* 23:623-632 Nov. 1957

Within Malaya and Singapore dental treatment is provided by three distinct groups of personnel. Division I dentists have a registrable qualification —for most, a degree from the University of Malaya. Division II dentists have received no formal dental education but have practiced dentistry and have passed a simple examination. School dental nurses have had two years' training at the Dental Nurses' Training School in the General Hospital, Penang. The Federation of Malaya, with a population of 7,516,000, on January 1, 1956, had 93 Division I dentists, 503 Division II dentists and about 80 school dental nurses. The dentist:population ratio is about 1:9,350.

A group of seven year old Malaysian children in Singapore in 1955 had an average of 3.6 DMF teeth; Chinese children of the same age group in Singapore averaged 4.2 DMF teeth. The dental problem in Singapore and Malaya is serious. On the one hand there is an acute shortage of available dental services, on the other, a high incidence of dental disease.

It has been proposed that the Department of Dentistry of the University of Malaya undertake research in three major fields: (1) surveys to determine the prevalence and distribution of the major dental disorders; (2) studies in the etiology of dental disease in Southeast Asia, and (3) research to develop appropriate preventive measures and to determine how existing and future dental services may be developed to provide effective and efficient dental treatment.

Yearly classes in the Department of Dentistry average 23 students. The school has physical facilities to permit the graduation of 45 students each year from the five year course.

In Singapore there are three distinct major racial groups—Chinese, Malaysians, and those originating from India and Pakistan. There exist considerable differences in the prevalence of various dental disorders among these three groups. The incidence of dental caries is highest amongst the Chinese population of Singapore and Malaya, not so high amongst the Malays, and lowest amongst the Indians; many Indians have an apparent immunity to dental caries.

A standardized method for carrying out dental epidemiological studies has been prepared.

Health Branch, Government of British Columbia, Canada

Incidence of caries at different locations on the teeth

John H. Barr, Ronald R. Diodati and Russell G. Stephens. *J.D.Res.* 36:536-545 Aug. 1957

Dental literature indicates little concern about information on the distribution of carious attacks further than counts of the average number of teeth or surfaces per mouth affected by caries. There is evidence to suggest that neither measure may have more than limited value.

The percentage incidence of three types of carious attack—pit or fissure, proximal and cervical—was determined for all permanent teeth in 583 men and women ranging in age from 13 to 40 years.

The pattern of attack indicated in general little increment in pit or fissure or in proximal caries experience after 21 years of age, but a progressive cervical attack throughout the age groups studied. No correlation was found between the incidence of the two forms of smooth-surface caries—proximal and cervical. There was

wide divergence in findings for both pit or fissure and for cervical types of lesions when computed with or without assumptions for caries in missing or restored teeth. Studies designed to evaluate potential caries-inhibiting agents should be designed to analyze the effectiveness separately for each type of carious attack and should not include arbitrary assumptions to cover missing teeth. Extensive studies, preferably of the vertical or continuing type, are needed to obtain further information on incremental patterns of carious attacks. This information could have predictive value useful to clinical researchers and to those attempting the formulation of plans for group dental care.

The data were examined for bilateral symmetry of the pattern of grouped findings for each type of caries experience in surviving teeth. The close correspondence of results for the right and left sides is believed to justify the pooling of data from right and left sides of the mouth.

Tufts University School of Dental Medicine, Boston, Mass.

Caries distribution in preschool children of Warsaw, Poland

(Zapadalnose na prochnice zebow u dzieci w wieku przedszkolnym na terenie Warszawy)

K. Grodzka, L. Augustyniak, K. Czarnocke, A. Dobrzanska, Z. Gutkowska and M. Szpringer. *Czasop.stomat.* 9:393-398 July 1957

By order of the Polish Ministry for Public Health and Education, the staff of the Dental Clinic of the University of Warsaw carried out an investigation of the incidence and distribution of dental caries in preschool children of Warsaw and its neighboring communities.

The condition of the deciduous and permanent dentition was examined in 5,055 kindergarten pupils between two and six years old. It appears that in Poland the preschool child requiring dental care is neglected. In children who had not reached their third birthday, almost 10 per cent of the erupted teeth are carious. More than 45 per cent of the teeth in children of the age group between four and six years showed carious lesions. Only 22 children had undergone any kind of restorative treatment. No significant difference in caries incidence was observed between boys and girls or between children from urban or rural regions.

The examination of the permanent teeth in six year old children revealed that caries in first molars was present in 56.3 per cent. In the deciduous dentition, the second molars appeared more caries-susceptible than the first molars, bicuspids, cuspids or incisors. The over-all percentage of caries-free preschool children was incredibly small (less than 1 per cent).

The recommendation submitted by the staff of the Dental Institute of the University of Warsaw to the Ministry for Public Health and Education included the following points:

1. An early diagnosis and immediate repair of carious defects in deciduous and permanent teeth will protect preschool children from premature tooth loss.

2. An introduction of periodic dental examinations and a creation of dental clinics in kindergartens will provide an improvement in the dental and general health condition of the children of this generation and of future generations.

3. Courses should be instituted for parents and teachers to acquaint them with the importance of dental care, oral hygiene and caries-preventive procedures.

4. More time should be devoted in dental schools to the teaching of orthodontics, pedodontics and school (preschool) dentistry.

5. The dental profession and the dental organizations should pay more attention to the dental and general health care of the preschool children.

Kliniki Stomatologii Zachowawczej, Warsaw, Poland

Clinical and bacteriologic studies of caries-immune human beings

Paul R. Weisenstein and Gordon E. Green. *J.D.Res* 36:690-694 Oct. 1957

Eighty-nine caries-immune adults whose ages ranged from 17 to 54 years were observed clinically and bacteriologically during a three-year period. The subjects were divided into three clinical categories based on the anatomic condition of the teeth, those in Category 1 having the most nearly anatomically perfect teeth. The term

"caries-immune" refers to those adults with no indication of dental caries, past or present.

Bacteriologic examination showed that low or zero salivary lactobacilli counts were common in most of the caries-immune persons, but no striking bacteriologic differences were found among the three clinical groups.

Five of the 89 adults developed caries in the period of the investigation. The repeated occurrence of high salivary lactobacilli counts, and especially the presence of rough colony lactobacilli in these five, appears to have served as an indicator of impending clinical caries.

Ohio State University College of Dentistry, Columbus, Ohio

The geographical distribution of dental caries of young school children in the Netherlands (period 1950-1953)

J. B. Zwaardemaker and S. W. Tromp. *J.D.Res.* 36:795-799 Oct. 1957

The frequency of dental caries among six and seven year old school children of the first class of the primary schools in the Netherlands was determined. The average percentage of children with perfect dentition for the Netherlands as a whole in 1950 was 44 per cent; in 1951, 40 per cent; in 1952, 37 per cent, and in 1953, 33 per cent.

Despite the general increase in incidence of dental caries since 1950, the general geographic distribution changed little. The province of Zeeland, which has a high caries frequency, borders on the west part of the province of Noord Brabant, which has a low frequency. The northwest strip of Noord Brabant with low frequencies borders districts with high frequencies between Rijn-Lek and Maas. The "sea-clay areas" of the northern part of the province of Groningen, west part of Friesland and north part of Noord Holland (West Friesland), in general, are characterized by a low caries frequency. Zeeland is an exception to this rule.

The old "peat areas" of southeast Friesland, southeast Groningen, Drenthe, and parts of Zuid Holland seem to have high caries frequencies. The "sandy areas" of Overijssel, Veluwe and W. Noord Brabant in general are areas with low caries frequencies. The typical "river-clay areas" seem to have high caries frequencies.

Pronounced autochthonous population groups, often with relatively backward hygienic habits (such as the agricultural population of Zeeland, eastern part of Noord Brabant and De Achterhock) are characterized by high caries frequencies.

Further studies are required to explain these geographic differences. A possible cause is the difference in soil in the various parts of the Haarlemmermeer. It would be worth while to study whether differences in the content of trace elements (particularly of fluorine) in the soil and water correlate with the decrease in the percentages of "perfect dentition."

The present study is a preliminary report. Detailed medicogeographic studies based on small administrative units may reveal various causes of dental caries which are difficult to find through ordinary clinical studies only.

Ogstgeest, Leiden, the Netherlands

Reaction of tooth surfaces with one ppm of fluoride as sodium fluoride

F. Brudevold, J. W. Hein, J. F. Bonner, R. B. Nevin, B. G. Bibby and H. C. Hodge. *J.D.Res.* 36:771-779 Oct. 1957

A study was made on the uptake of radioactive fluoride from sodium fluoride solutions containing 1 ppm of fluoride by the enamel surfaces of extracted teeth. The uptake varies in different teeth and different areas on the same tooth.

Brushing with water caused a rapid loss of fluoride during the first three minutes, and a decreasing loss thereafter. Brushing with abrasives removed most of the fluoride after 30 seconds, demonstrating that there was only a slight fluoride penetration into the enamel.

The uptake was greatest during the first few minutes of exposure and decreased with time.

Pumiced, ground or acid-etched surfaces showed greater uptake than intact surfaces.

Slightly demineralized areas, that is, brown or white spots, showed greater uptake than sound enamel.

Eastman Dental Dispensary and University of Rochester, Rochester, N.Y.

Incidence of dental and gingival lesions in Maues Indians (Sôbre a incidencia de lesões gingivo-dentárias entre os indios Maués)

Ataliba Macierira Bellizzi. *Rev.brasil.odont.* 15:22-27 Jan.-Feb. 1957

Assigned to the committee to study cancer in Brazilian Indians, the author examined the oral conditions present in 300 Maués Indians. This tribe lives on the shores of the Amazon River, a region abundant in vegetation, where fishing and hunting is plentiful. These Indians do not eat bread, and seldom drink milk. They roast fish and animal meats over open fires. Sugar cane is greatly appreciated as well as "mandioca" flour.

There are about 2,000 Maués Indians, and they live in groups of 50 to 100 individuals, ruled by a chief. Medical attention is given by a midwife, and dental knowledge is limited to the application of weed macerations for toothache. Teeth generally fall out on their own, but when they become troublesome may be removed manually or with vegetable fibers.

The Indians lack all knowledge of oral hygiene, and further provoke dental lesions by sharpening their teeth with a stone or knife at puberty. This beautifying procedure is performed more frequently on girls than on boys.

Caries is the most frequent dental lesion, and all persons seven years old have decay on one tooth at least; between 7 and 15 years of age, 4 per cent of all molars show caries; of these 69 per cent were lower molars.

Because it was impossible to take roentgenograms, not many periapical lesions were discovered, but pain was present in 36 per cent of the lesions diagnosed clinically.

Of all adults examined, 48 per cent had periodontal disease. Women constituted 92 per cent of these patients.

Dental and periodontal disease is prevalent among these Indians because the calcium content of their diet is low, because they mutilate their teeth at puberty, and because their knowledge of oral hygiene and dental treatment is extremely rudimentary.

Escola de Medicina e Cirurgia, Rio de Janeiro, Brazil

Proteolytic organisms of the carious lesion

Genevieve D. Roth. *Oral Surg., Oral Med. & Oral Path.* 10:1105-1117 Oct. 1957

Although research for many years has been directed toward the cause of dental caries, the exact mechanism remains unexplained. Studies of the composition of the teeth have shown that they are made up of two main constituents—inorganic salts and an organic matrix. Dental caries destroys both constituents. From this knowledge two major theories have been developed—the acidogenic and the proteolytic—to explain the carious process. Although the bacteriology of the former has been well explored, most of the proteolytic theories are based on histologic evidence.

When a search for the proteolytic organisms in the carious lesion has been made, the isolations have been random samplings with a subsequent study of the organisms directed toward their ability to lyse miscellaneous unrelated proteins. Advances in analytic technics utilized on the organic matrix of the tooth have resulted in a definition of the structure as the protein, collagen. It is present in dentin, cementum and, to a lesser degree, in enamel.

If the collagen (organic matrix) breakdown which occurs in caries is to be explained, it would seem pertinent to study the organisms present in the lesion and investigate their relation to collagen chemistry.

One hundred and two organisms capable of lysing hide powder were isolated from the carious lesions of 104 teeth and divided into five groups. Group I resembles Onisi's *Actinomyces dentocariosus* (1949) but, in keeping with the newer naming procedure, these should be renamed *Nocardia dentocariosus.* Group II is designated as *Gaffkya dentocariosus.* Group III could be listed as a variant of *Micrococcus pyogenes* var. *albus* or could carry its own species designation. Group IV is a mixed group of anaerobic streptococci and Group V is a strictly anaerobic form of Actinomyces. Their presence in the carious lesion suggests a role in the proteolysis of collagen, the organic constituent of teeth.

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Histology

A study of neural endings in the human gingiva and periodontal membrane

Robert Rapp, William D. Kirstine and James K. Avery. *J.Canad.D.A.* 23:637-643 Nov. 1957

An investigation of the distribution of nerves and neural endings was carried out on human gingiva and periodontal membrane by the use of the Powers' modification of Romanes' method of silver impregnation.

Organized neural terminations are more abundant in the region of the attached gingiva than in the free gingiva. Three types of encapsulated, organized neural terminations are found in the connective tissue papillae of the attached gingiva. These endings consist of Meissner-type corpuscles, Krause-like end bulbs and tightly coiled knobs. Fine, free neural endings occur in other regions of the attached gingiva.

The large neural trunks of the periodontal membrane apparently arise from the apical region of the alveolus and run toward the gingiva in the direction of the long axis of the tooth. These large trunks lie in a central position in the periodontal membrane and pass to the gingival third in association with blood vessels. Fine neurofibrils enter the periodontal membrane from the alveolar bone and run both apically and gingivally. Organized, encapsulated neural terminations are seen throughout the membrane. These structures are ovoid and consist of interwoven fine neurofibrils. Other fine, free neural endings also exist throughout the periodontal membrane. There are neural coils along the surface of the cementum. Other fibers pass toward the surface of the cementum but, before contacting this surface, curve back into the membrane proper.

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Innervation of dental germs

(L'innervazione del germe dentale)

A. Maccaferri. *Riv.ital.Stomat.* 12:446-466 April 1957

The innervation of dental germs was studied in 50 sheep fetuses of various body lengths (from 8 to 44 cm.) at the Institute of Histology and Physiology of the University of Bologna, Italy.

In dental germs of incisors in sheep fetuses 15 cm. long, the branches of the inferior alveolar nerve reached to the base of the dental papilla and spread to the dental sac and to the mesenchyma below the epithelium. The papilla remained free of innervation. The rich network of nerve fibers which surrounded the dental germs in fetuses less than 12 cm. long was not observable in larger fetuses.

In fetuses less than 10 cm. long, a rapid increase in the formation of nerve fibers occurred. In the larger fetuses, these nerve fibers formed dense nerve fasciculi.

In the period in which the development of the enamel occurs, these nerve fibers were barely observable. After the formation of dentin and the deposition of calcareous substance had taken place, argyrophily of the reticular tissue occurred at the site of the odontoblasts as well as in the papillae.

Tortuous nerve fibers proceeded along the longitudinal axis of dental germs. These nerve fibers are difficult to differentiate from nonmedullated fibers.

The germs of the central incisors are innervated at an earlier period than those of the lateral incisors. Only in fetuses more than 40 cm. long could the innervation of the dental germs of upper and lower lateral incisors be observed.

The nerve fibers which permeate the papillae were visible only in central slices. In older fetuses they were observable in the peripheral portion of the papillae where their course followed that of the vessels which they encircled without forming anastomoses.

In fetuses 44 cm. long, innervation of all dental germs with medullated nerve fibers had taken place. Dense nerve fasciculi followed the course of the vessels. From these small nerve bundles, extremely fine nonmedullated fibers branched out

which showed a characteristic thickening along their axes. These fibers ran in a retrograde direction toward the apexes and were dichotomously distributed.

Similar nonmedullated fibers were found by Armenio and Laforgia in the pulps of young calves and fawns. These authors assumed, however, that the observed nerve fibers were branches of vegetative-parasympathetic nerves rather than branches of sympathetic nerves. Recent histologic research did not verify this hypothesis, although it is still undetermined whether these nonmedullated nerve fibers are branches of parasympathetic nerves.

If the papillae of fetuses less than 40 cm. long showed a rich network of nerve fibers, this type of innervation of the dental germs usually was accompanied by a permeation of nonmedullated fibers into the region of the odontoblasts. These nonmedullated fibers appeared in the form of straight, loop-shaped or fascicular threadlike structures.

Istituto di Istologia e Fisologia, University of Bologna, Italy

Some morphological considerations on the dentinal tubules

(Algunas consideraciones morfológicas sobre los canalículos dentinarios)

Artemia Fuentes. *An.fac.odont.,Montevideo* 2:105-121 No. 4, 1956

Histological studies of human teeth made with toluidine blue and orange G revealed certain aspects of the dentinal tubules which either are not seen or are seen less clearly when other methods of staining are used. The specimens were teeth extracted because of malposition (mostly third molars), supernumerary teeth, teeth extracted in order to facilitate orthodontic correction, solitary teeth extracted to permit the making of complete prosthesis, and teeth lost through periodontal disease. In addition, studies were made of deciduous teeth, some partially resorbed, some carious, and a few completely sound.

The walls of the canals appear outlined by two dark lines. Within lie Tomes' fibers, and between them and the wall is a space called variously the translucent area or the lymphatic space. The tubules themselves extend from the pulp to the enamel or to the cementum, according to location, with a corresponding variation in length according to the tooth in question. In permanent teeth the course of the tubules is not straight, but more or less curved. In deciduous teeth, however, they often appear without a curve in the root so that, throughout almost their whole extent, they are perpendicular to the major axis of the tooth. As a rule, the tubules are believed to be fairly regular in size, form and distribution, but this is not strictly true. Some were seen to vary not only in diameter but also in the number and size of their ramifications. Excluding the secondary dentin, the greatest variations in form and direction were found in the interradicular portion of the molars. Some of the deciduous teeth showed blotlike formations which were found to consist of various groups of tubules that curved inward enclosing terminal ramifications at the dentinoenamel junction. No appreciable numerical difference was evident between the terminal ramifications in the crown and those in the root, but those in the crown differed from those in the root by being thicker and less delicate.

In some of the sections, irregular enlargements, differing from the fusiform or spherical enlargements that have been interpreted as enlargements of the dentinal sheath, could be seen crossing the tubules. These enlargements were most numerous in sections showing large numbers of communicating branches, and this suggests the possibility that they may represent enlargements of the sheaths in these branches.

Finally, certain pear-shaped enlargements resembling the hanging nests of the golden oriole occasionally were seen hanging down from branches originating in the tubules. No opinion can as yet be expressed in regard to the significance of these formations.

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Roentgenology

Processing dental radiographs

Henry Mandiwall. *Bul.5th Dist.D.Soc.(Calif.)* 5:11, 22-23 Aug.-Sept. 1957

Most standard developers for dental roentgen-ray film bear a standard time-temperature recommendation: five minutes when the temperature of the fresh solution is 65° F. If the processing is correct and the roentgenogram lacks density, probably it is underexposed. If it is too dense, overexposure has occurred. Underexposure can be corrected by increasing the exposure time about 50 per cent; overexposure, by reducing the exposure time 50 per cent.

The tank method is the simplest for processing the film. All solutions should be kept between 65° and 70° F. The temperature of the big tank of water which holds the small tanks of developer, fixer and washing water can be controlled thermostatically. Processing solutions should be mixed in recommended strengths. Developers should be made up in the same strength. Exact time-temperature control is essential. If a constant processing technic is maintained, exposure time easily may be altered for best results.

A film which is too thin because of faulty technic should be remade if possible. An intensifying solution may change the color of the film. Ready-made intensifying solutions may be used, or the following formula: potassium bichromate, 90 Gm.; hydrochloric acid (concentrated), 64 cc., and water to make 1,000 cc.

One part of the solution is taken to ten parts of water, and the image is bleached thoroughly in this solution. The film is washed until the yellow stain is removed, and redeveloped in artificial light or diffuse daylight, washed and dried.

A reducing solution for overdeveloped film has the following formula: water, 1,000 cc.; ammonium persulphate, 60 Gm., and sulphuric acid (concentrated), 3 cc. One part of the stock solution is taken with two parts of water. After the film has been reduced, it should be immersed in an acid-fixing bath for five minutes, then washed for 20 minutes in running water.

Overexposed or overdeveloped films should be retaken; if this is not possible, a reducer will remove some of the film. Ready-made reducers may be used, or the following formula: solution A—potassium ferricyanide, 75 Gm., and water to make 1,000 cc.; solution B—sodium thiosulphate (hypo), 240 Gm., and water to make 1,000 cc. These solutions should be mixed only when ready to be used. In a glass beaker, one part of solution A, four parts of solution B, and 27 parts of water are placed. The film is washed to remove all fixative and then is lowered into the solution. Before the film is examined, it should be rinsed in water to prevent streaking. When the desired reduction is obtained, the film should be washed in running water for 20 minutes. If only one area of the film is to be reduced, that area should be rubbed with a cotton-wrapped applicator saturated with the mixed solution.

In underexposed film, insufficient radiation produces a thin image but the area of film outside the image is fairly dark. Underdeveloped film lacks this rich blackness, especially outside the area of the image.

In overexposed roentgenograms, all parts of the image are proportionately dark. If held up to a light, the film looks almost normal. In overdeveloped film, the density increases and the white areas turn grayish with fog. Fogged film appears dark all over. Fog is caused by outdated or old film, light leaks in the darkroom, hot developer, unsafe lighting or stray radiation. Streaks may be caused by turning on a white light in the darkroom before the film has been fixed sufficiently. Small white spots usually are caused by dirt or dust adhering to the emulsion. White spots in rows usually are caused by air bubbles, and can be avoided by agitating the film for a few seconds after lowering it into the developer.

If the film surface is blistered, or looks crinkled or uneven, the temperature of the processing solution was too high, or the difference between the temperature of one processing bath and another was too great, or the fixing bath was too acid.

An image that gradually fades or turns yellow usually is caused by improper fixing or inadequate washing.

Dull, flat roentgenograms with about the right over-all density usually indicate incorrect exposure followed by incorrect development. If there is a general lack of contrast for no apparent reason, it is better to make a fresh developing bath and readjust the exposure technic.

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Controlled intratumoral and intracavitary treatment with radiogold
(Kontrollierte intratumorale und intrakavitäre Radiogoldtherapie)

H. Oeser, W. Schlungbaum and H. G. Mehl. *Fortschr.Röntgenstr.Nuklearmed.* 83:792-802 Dec. 1957

Although radiogold (Au^{180} and Au^{190}) has been used for over eight years in the treatment of various oral tumors, the determination of the amount required and the control of the dose applied still offer problems which, as yet, have not been solved satisfactorily.

After experiments with radiogold, carried out at the Institute of Radiation of the Free University of Berlin, the necessity for a better control of the applied radioactive isotopes of gold and for a clearer observation of their course within the tumor tissue and the entire organism was established.

At the institute, a radiogold solution was used which, stabilized in gelatin, had particles of 60 millicrons diameter. This solution was obtained from the Radiation Institute in Amersham, England.

After an injection into an oral tumor or introduction into another region of the oral cavity, the distribution of the radiogold in the patient's body was studied with a scintiscanner. The iso-intensity curves at various intervals, up to a maximum of two weeks, were determined. In this manner the changes in the radioactive deposits were observed and the quantity of radiogold in the tumor and in different organs was demonstrated.

On a chart, the iso-intensity curves were superimposed on the patient's profile, and the distribution of the radiogold and the location of the maximum intensity established.

Blood samples were taken 6, 24 and 48 hours after injections, sometimes to a maximum of 12 days.

The radioactivity was measured with a Siemens-Reininger scintillation counter. Similarly, 24-hour specimens of urine were examined. A strict clinical study of the radiation effect of radiogold accompanied these procedures to evaluate the possible damage to the blood.

Case reports of 14 patients who had received intratumoral injections of radiogold and of four patients who were given intracavitary treatments are presented. The amount of radiogold injected varied from 20 to 150 millicuries which produced tumor doses of from 10,000 to 100,000 rads.

The comparatively favorable results obtained in the majority of instances led to the conclusion that under a "controlled" application of radiogold, certain types of oral tumors can be destroyed.

Strahleninstitut der Freien Universität Berlin, Germany

Use of intensifying screens in roentgenotherapy of malignant oral tumors
(Použitie mriežky
v röntgen terapii zhubnych nádorov)

J. Durkovsky. *Bratisl.lek.listy* 37:153-160 Aug. 1957

At the Cancer Institute of the University of Bratislava, Czechoslovakia, roentgenotherapy of malignant oral tumors, mainly carcinoma, was unsuccessful in 42 of 100 patients.

When living tissue cells are exposed to irradiation by ionizing rays, damage to the cell structure results. The extent of this effect varies with the type of cell and the amount of radiation.

Success in curative roentgenotherapy of malignant oral tumors depends on the ability to deliver a quantity of radiation which will be lethal to cancer cells but within the tolerance of the surrounding tissue.

It was established that when roentgen rays irradiate the target area, less than 1 per cent of energy was absorbed. The remaining 99 per cent passed through without a curative effect. Any

technic which utilizes this 99 per cent or a significant part of it, therefore, would be advantageous.

Certain chemicals have the property of absorbing roentgen rays and emitting their energy as light, especially as blue, violet, ultraviolet or infrared rays. Calcium tungstate, a white, crystalline salt, possesses a high fluorescent property. This chemical can be used as a coating material for intensifying screens to obtain better results in roentgenotherapy of malignant oral tumors.

Since 1955, time intensifying screens covered with calcium tungstate have been used at the Cancer Institute; failure in roentgenotherapy of malignant oral tumors has been reduced by 50 per cent.

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Disaster monitoring with dental x-ray films

Margarete Ehrlich. *Radiology* 68:251-254 Feb. 1957

If an atomic disaster were to strike an urban community, it would be of great importance to have available some means of reconstructing, at least approximately, the pattern of the radiation dose distribution over the different sections of that community.

Recent studies to investigate the usability of dental x-ray films in disaster monitoring were made in laboratories and in actual field exposures to radiation from the detonation of nuclear devices during the 1955 series of atomic tests at the Nevada test site.

The studies revealed that dental x-ray films could be used for monitoring if they had been exposed in their original packages, provided the dose interpretation was made from the density on areas not obliterated by the image of the central metal spool, and located in the outer third of the film length. Dental films exposed in large boxes containing 100 or more films were found to be inadequate mainly because of the filtering action of the lead backing of some of the dental film packages.

Since there were considerable variations in the results following different film processing technics, it appears imperative that all films be processed in one laboratory, and if possible, all films be processed simultaneously, calibration films being included with the unknown samples.

National Bureau of Standards, Washington 25, D.C.

Radioactive strontium in treatment of oral tumors

(Utilisation du radiostrontium dans le traitement de tumeur buccale)

Jean E. Pahaut and Jean Govaerts. *J.radiol.èlectrol.* 37:164-168 March-June 1957

At the Roentgenographic Institute of the University of Liège, Belgium, three patients with malignant oral tumors were treated with a combination of external roentgenotherapy and an oral administration of radioactive strontium, Sr^{89}.

The isotopes of strontium[89] have a half life of 55 days and are essentially pure beta ray emitters with a maximum energy of 1.3 millivolts.

To each patient, a total of 30 Gm. of $Sr^{89}CO_3$ was administered in tablet form (six tablets for five days).

Urine and feces were saved and the ionizing particles determined with a Geiger-Müller counter for ten days. Blood samples were taken daily (also for ten days) and blood serum tests were made frequently.

In the first case reported, osteoblastic sarcoma, the concentration factor was calculated to be 12 per cent; in the second case, osteoblastic metastases, 7 per cent, and in the third case, 4 per cent.

The evaluation of the dissipated radioactivity (calculated in reps and rads) showed that the effect of the beta rays emitted by radioactive strontium on the tumor tissue was remarkable.

In all three patients, treatment with radioactive strontium has produced excellent response in a comparatively short period of time. There were no irreversible organic changes.

This seems to indicate that the use of orally administered radioactive strontium in combination with external roentgenotherapy considerably improves the result of treatment of malignant oral tumors, especially of those which are characterized by rapidity of growth.

Centre de Radiologie, Université de Liège, Belgium

History

Early practice of dentistry in colonial Mexico

(Zahnärztliche Tätigkeit im kolonialen Mexiko)

Ernesto Cohn. *Zahnärztl.Mitt.* 45:640-641 Oct. 1, 1957

The colonial period in Mexican history began with the overthrow of the Aztec empire by Spanish forces (1519-1521), and the rapid extension of Spanish conquests from what is now known as Mexico City.

New Spain, as the colony was called, was one of the four viceroyalties of the Kingdom of the Indies and consisted of what is now Mexico, Panama, Venezuela, the West Indies and the Philippines.

The natives had physicians of great experience. This fact was mentioned in the earliest reports of Spanish scientists.

One of the first writers on Aztec, Inca and Mayan medicine was Sahagún, who was not a physician. He reported without professional bias his observations.

Hernández, whose work is a treasure of Aztec medical art, however, projected European views into his reports on the early medical traditions of the Mexican natives. Also Cárdenas attempted to interpret Aztec medicine and dentistry in terms of Aristotelian philosophy.

In the archives of the Vatican Library in Rome a small manuscript is kept, bound in sixteenth century crimson velvet, which contains a treatise on Mexican medicinal plants, native remedies and an interesting account of the early practice of dentistry in colonial Mexico. This manuscript, the *Codex Barberini* or *Badianus Manuscript,* was written by two Aztec physicians during the first period of New Spain.

Martinus de la Cruz was the author and Juannes Badianus edited the manuscript and translated it into Latin in 1552.

Two translations into Italian were made a short time later. One of these is kept at the Royal Library of Windsor, England, and the other at the Vatican Library. From the Windsor version, E. W. Emmart prepared the first translation into English which was published by the Johns Hopkins Press, Baltimore, in 1940.

The *Badianus Manuscript* contains 13 chapters of which the first deals with the anatomy and pathology of the head. The fifth chapter is completely devoted to early Aztec, Inca and Mayan dental practice. It deals with the following subjects: (1) dentifrices and sparkling teeth; (2) treatment of swollen and abscessed gums; (3) toothache; (4) heat of mouth and throat; (5) dried-up saliva; (6) bleeding in the mouth; (7) hiccups and coughs, and (8) halitosis.

Several diseases are mentioned which were later identified as gingivitis, dental caries, dentoalveolar gangrenous stomatitis, facial neuralgia and oral inflammations of various causes.

In the sixth chapter other oral diseases, such as lockjaw, periodontitis and contraction of the masseter muscle, are described. This early Mexican pharmacopeia contains illustrations in colors, made by Martinus de la Cruz, which depict Aztec symbols, mythology, medical and dental treatment methods, materia medica and various Mexican medicinal herbs and plants.

Valuable information on the practice of dentistry by the natives of colonial Mexico is contained in the work *General History of Events in New Spain,* which was written by the Franciscan monk Bernardino de Sahagún between 1557 and 1569. In its sixteenth chapter, remedies to alleviate toothache and to heal tooth extraction wounds are mentioned.

The Augustinian monk, Augustine Farfán, wrote in 1592 his *Brief Treatise on Native Medicine,* in which the anatomy of oral structures such as teeth, soft tissues including the oral musculature and the skeleton of the head is presented.

During the seventeenth century, however, the influence of native, especially Aztec, knowledge of and experience in Spanish medicine and dentistry decreased. The books written by Juan de Jesúsy Maria Barrios (1607), Francisco Ximénes (1605) and Gregorio López (1672) are more or less concerned with medicine and dentistry as practiced by Spanish physicians in colonial Mexico.

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General

Oral photography using ultraviolet light and reflex-decreasing media

Birgitta Lindenstam. *Odont.Revy* 8:492-501 No. 4, 1957

A technic has been developed mainly for photographing upper incisor teeth to register the presence and extent of mottled enamel. Various combinations of light source, filter and camera were tried, and the best results were obtained with a combination of a Leica camera with a mirror-reflex attachment, a bellows, a Hector f 13.5 cm. lens; a "blue-point" electron flash (Reporter 51) which gives a strong, effective light lasting 1/5,000 of a second; Adox KB 14 orthopanchromatic film, and two Jenaer filters, the U.G.1 and B.G.2. Developing was done in Rodinal in a 1:40 dilution for 16 minutes.

The camera and its attachments were fixed on a tripod which could be adjusted to different heights. A large, stable tripod was used for photography in the dental school but, as this was heavy and bulky, a simpler type was used for field work.

One advantage of the Leica is the low cost of film and another is that photographs of a patient can be taken from different positions at different degrees of enlargement and all on the same piece of film.

The results obtained in the early stage of the investigation were spoiled by disturbing light reflexes from the teeth and mucous membranes. As it did not prove possible to avoid the reflexes by photographic means, the surfaces of the teeth were coated with a thin layer of emulsion. Buttermilk was used as the emulsion, because it was of the right consistency and could be obtained in Malmö direct from the dairies.

Selection of the field and focusing were carried out with illumination from weak photo floodlights. In most instances only one light was necessary so that the patient did not have to sit in the strong light and heat produced by the usual light sources.

The U.G. 1 is a dark-violet filter which allows only ultraviolet and infrared rays to pass. The second filter, the B.G. 21, is an almost colorless, heat-absorbing filter. Both these filters are placed in front of the lens during the exposure. They reduce the light intensity so that the smallest apertures cannot always be used. This tends to reduce the depth of focus, but is of no great importance when only the anterior part of the

Figure 1 Left: Taken with a Leica with a Hector lens and electron flash. Right: Taken with the same equipment but with U.G. 1 and B.G. 21 filters. Note the increased detail, particularly in the upper teeth

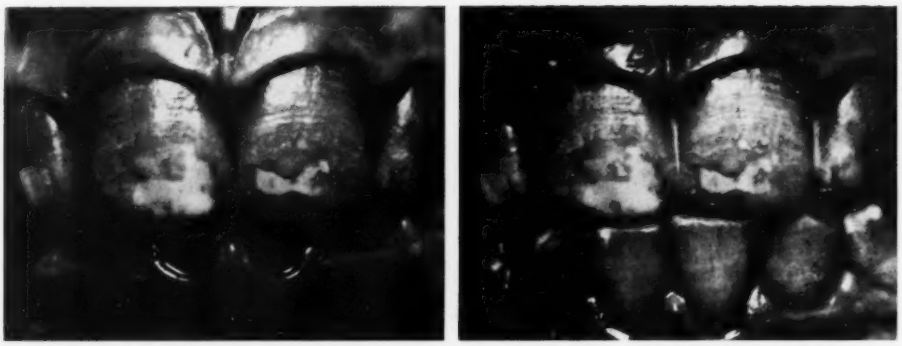

Figure 2 Left: Filters U.G. 1 and B.G. 21 and Leica with Hector lens and electron flash were used. Strong high lights are present but the general detail is good. Right: The same as left, but buttermilk emulsion has been used. The high lights have disappeared. The rendering of detail is unaltered or even improved

Figure 3 Above: Asymmetrical hypoplasia. Taken with U.G. 1 and B.G. 21 filters and a Leica with Hector lens and electron flash

Figure 4 Below: Buttermilk emulsion, U.G. 1 and B.G. 21 filters, electron flash and a Leica with a Hector lens were used. The Retzius' striae and perikymata are particularly well shown with this filter combination

mouth is being studied. A fairly good depth of focus is obtained, however, with apertures of f 8 and f 11.

With the above combination of equipment it was possible to record changes in the enamel which were not visible to the human eye. Mottled areas were much more distinct on the photographs than they were to the eye. This improved recording of detail was due mainly to the use of the ultraviolet light. Capillary vessels of the vascular system are shown clearly, and very fine branches can be demonstrated with this type of filter combination.

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Hypnotherapy in the treatment of glossalgia
(K voprosu gipnoterapii glossalgii)

G. M. Volgin. *Stomat.,Moscow* 36:3:71
May-June 1957

The Stomatologic Polyclinic of Maghachalka has experimented with hypnotherapy in the treatment of patients with glossalgia. Eighteen patients whose condition had not improved with medication were selected. Careful attention was paid to their complaints and anamnesis. Each patient was hypnotized at least eight times. Usually, the patient recovered from the glossalgia after three to four sittings; the subsequent hypnotic treatments were given to stabilize the healing.

Although the number of patients treated was small and the time of follow-up observations was short, it is concluded that hypnotherapy should be used in the treatment of glossalgia.

Medghis, Petrovka 12, Moscow, U.S.S.R.

Silicones:
a review of suggested applications in medicine and dentistry

Harry L. Levin. *Mil.Med.* 121:397-402 Dec. 1957

In dentistry and oral surgery, silicones have been employed experimentally for the sterilization of handpieces and surgical instruments, in root canal therapy, in complete and partial denture technics, in crown and bridgework, and as a protective agent for the hands of operators and surgeons.

Silicone fluids, or "oils," are being used as a substitute for water in sterilization because they have excellent stability even when exposed to the air at high temperatures for long periods of time. They last indefinitely at 150° C. The only fluid that is lost is that which adheres to the instruments during sterilization. Silicone fluids are not corrosive to common metals at temperatures up to 200° C. even in the presence of oxygen. They prevent dulling of sharp instruments and wear on movable parts being sterilized.

Crowley and Ostrander (1948) advocated the use of silicone in the dental sterilizer for the sterilization of dental handpieces, since the silicone lubricated the fine mechanism while it sterilized. Silicone oil may be used as a lubricant in nitrous-oxide-oxygen gas machines dispensing highly volatile anesthetics which are incompatible with petroleum oil base lubricants. Leather diaphragms treated with silicone resin remain flexible for long periods in the dental socket syringe which may be sterilized without rusting and impairment of the steel spring and the leather diaphragm. Impregnated washers may serve as anti-creep agents to prevent the leakage of oil and water in the dental cuspidors and aspirating apparatus.

Silicone oils may be used as a hydrophobic agent in biological bottles that are used to dispense antibiotics, drugs and chemicals so that the full benefit of the contents may be utilized.

As a treatment for the patient with Costen's syndrome, Merkeley (1956) employs a prosthetic appliance for the mandible consisting of silicone rubber saddles.

Paynter and others (1955) found that methyl silicone resins can be used to protect the pulp under silicate cement fillings.

Silicone elastomer for impression procedures is the first entirely different and universal impression material offered. After setting within four minutes, it becomes a tough, elastic, unchangeable gel, which can be drawn over the most severe undercut without fear of distortion or getting an elongated cast. It does not have to be poured immediately or placed in any solution to prevent dehydration or chemical decomposition. The impression, when wiped clean of saliva and dried, may be set aside for several hours before the model is poured, without fear of shrinkage or impairment of the impression.

Silicone hand creams and lotions are useful for practitioners who are allergic to soap.

Silicone fluids may be used to lubricate glass stoppers to prevent fusing, as a coating in calibrating apparatus, and to prevent meniscus formation in fluids. They prevent "freezing" when used on the glass plungers of hypodermic syringes.

Although silicone has no therapeutic properties, it should find a place as a vehicle for the suspensions of barium sulfate, and so forth, as a contrast medium in outlining internal cavities, sinuses and fistula tracts, where a water or an oil base is not desired.

U.S. Navy Receiving Station, Boston, Mass.

Requirements of the general practitioner's dental cabinet and tray from a time and motion standpoint

A. E. Kopp. *Bul.Greater Milwaukee D.A.* 24:10-11 Jan. 1958

The dental cabinet may be placed on tracks if only forward and backward movement is desired, or on casters for complete mobility. The cabinet should be 36 inches high if used from a sitting position, 40 inches high if used from a standing position.

Each drawer of the cabinet should be of such size and depth as to accommodate all the instruments and supplies for one entire operation. For example, all the necessary cutting instruments and revolving instruments to complete any type of cavity preparation should be placed in the top drawer. For quick identification and easy replacement, the instruments may be covered with colored plastic sleeves. A small piece of the corresponding colored plastic is then glued to the outside of the drawer for easy selection.

The supplies most often used should be placed in the second drawer. For example, if the operator places more amalgam restorations than other types, he would use the second drawer for all the necessary medicaments, cavity lining materials, mercury, alloy, matrices, and all the necessary instruments to place and countour any class of amalgam restoration. The third drawer is used for the next most frequent operation.

Instrument trays in the drawers should be made of stainless steel so that the entire tray may be removed and placed in an autoclave or other similar sterilizer. The trays should be ribbed to facilitate the easy handling of instruments, and magnetized so that instruments will not fall while the trays are placed. Duplicate trays avoid delays while instruments are being sterilized. Drawers should have safety latches.

The ideal cabinet would open automatically and bring the drawers to the desired working height behind the dental chair. The drawer needed for the desired operation would be selected by a foot control to maintain the aseptic condition of the hands of the operator and his assistant. A selecting device similar to that which selects records in the automatic jukebox would be even more efficient. The outer shell of the cabinet should be covered with Formica, in a color and grain to harmonize with the room.

The top hooded rack should be provided with electrical outlets for the electrical amalgamator, the gold foil condenser, the instrument sharpener and other electrical devices. A Cordomatic reel will control the excess electrical cord, and can be suspended from the wall, floor or ceiling.

The cabinet should have a hidden shelf, similar to a breadboard and directly under the top surface of the cabinet, which can be pulled out on either side or in front. The shelf, the top of the cabinet, the service tray and the mouth of the patient should receive illumination of the same intensity, to reduce eye strain. The top edges of the cabinet should be raised or flanged. Two foot-controlled receptacles could be placed at the bottom of the cabinet, and sealed off, for refuse and soiled towels.

1220 Wells Building, Milwaukee, Wis.

The dentist builds his office

North-West Den. 36:355-364 Nov. 1957

Because an increasing number of dentists are becoming owners of their office buildings, the editors of *North-West Dentistry* decided to investigate the experiences of such dentists. About 300 dentists in Minnesota, North Dakota and South Dakota own their buildings. A questionnaire was sent to these dentists, asking:

1. If you had it to do over again, would you still build your own place?
2. Do the freedom and joy of the intangibles outweigh any additional costs, operational problems, upkeep, and so forth?
3. How is your production record?
4. Would your honest appraisal show a greater net income, taking everything into consideration?
5. Did you employ an architect to plan your office?
6. Do you have a full basement?

About 100 dentists responded. Only one said he would not build again. Among the advantages of owning one's building, the following were mentioned frequently: pride of ownership, enjoyment of work, freedom from landlord, freedom from traffic and parking problems, gratitude of patients, improvement in net income, increased

dignity for dentistry, good financial return, no worry about future location, and no stairs to climb. Among the disadvantages mentioned are: additional costs; troublesome details about taxes, insurance, redecorating and repairs; time-consuming maintenance details, and high cost of new building.

Many dentists recommend a building large enough to produce some income from the rental of space, to cover the cost of upkeep. Several stress the point that the building adds to the value of their estate. Most recommend employing an architect and soliciting the advice of the dental supply houses.

Quotations from the replies to the questionnaire are presented, with photos of some of the buildings, and floor plans.

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Efficient appointment scheduling

Robert N. Tanis. *J.A.D.A.* 55:834-839 Dec. 1957

Today, more than ever before, all phases of dentistry must be practiced efficiently. The dentist must initiate efficient appointment scheduling. The appointment book is the guide to efficient scheduling. The appointment book must be set up months in advance around a "skeleton matrix" —a pattern on which the operator's productive time is regulated according to long, short or "flash" appointments, and on which the "cushion periods" and office holidays are blocked off over a period of six months in advance. This pattern lays the foundation for a high degree of efficiency and production.

In setting up the appointment book, the dentist begins by marking off the days his office will not be open. Next the customary holidays are eliminated. Vacations, dental society meetings, study club meetings and conventions are indicated.

A half-day cushion period within every five-day work week should be provided for. These cushion periods might be used for certain emergency patients and patients given preference from the call list of new patients and overflow patients.

Generally, the morning hours are reserved mainly for longer appointments, younger children and all difficult dental problems. The afternoons are reserved for the daily one-hour cushion periods, shorter appointments and easier treatments. Little or no reservation of time need be used for flash appointments; these usually are grouped together and finished daily at one time, such as three or four flash appointments during the latter one half of the afternoon cushion hour.

The cushion hour might well follow the noon hour immediately. On days when unforeseen problems extend the dentist's morning appointments into the noon hour, he need not sacrifice his lunch and midday rest period, for he can utilize a portion of the cushion hour. The cushion hour is an essential part of the efficiently planned day; it provides a definite time for treating emergency toothaches without jeopardizing scheduled appointments; it provides time for checking on laboratory work in progress, and for attending to various office problems.

The personnel needed to perform efficient appointment scheduling may vary according to the size of the dental office.

The recall procedure should enable the dentist to offer a checkup appointment two, four or six months in advance. These prearranged appointments should be kept at all costs by the dental office through advanced scheduling in the skeleton matrix.

701 West 111th Street, Chicago, Ill.

Use of epinephrine with local anesthesia in hypertensive patients. I. Blood pressure and pulse rate observations in the waiting room

E. Cheraskin and T. Prasertsuntarasai. *J.A.D.A.* 55:761-774 Dec. 1957

The question of whether epinephrine should be injected with local anesthetic agents for dental procedures in patients with cardiovascular disorders has been debated for years. The New York Heart Association has recommended that for any one dental session there be used no more than 10.0 cc. of 1:50,000 epinephrine—no more than 0.2 mg. of epinephrine in any form. This recommendation was not based on any experimental studies.

There is a need to ascertain on an experimental basis whether the administration of epinephrine should be combined with local anesthesia in

hypertensive patients in the usual office procedure.

In this first report, a study was made of blood pressure and pulse rate in 136 patients while they were seated in the waiting room anticipating dental surgery. The observations were compared with those obtained the following day, at which time observations were made with the patient in a sitting position and after remaining in a supine position for one hour.

The following conclusions were reached:

1. The systolic, diastolic, mean and pulse pressure levels obtained in the waiting room were higher than those obtained with the patient in a basal condition.

2. The greatest increment was observed in the systolic pressure.

3. The higher levels obtained in the waiting room were not exclusively the result of physical activity and gravity.

4. There was no statistically significant increase in the pulse rate obtained in the waiting room over that recorded with the patient in a basal state.

5. About one out of every four patients was unaware of his blood pressure status.

School of Dentistry, University of Alabama, Birmingham, Ala.

We can eliminate the broken tooth: mouthpieces make contact sports safe for your players' teeth

Joseph P. Dolan. *J.Health,Phys.Educ.& Recreat.* 28:18, 74 Oct. 1957

In athletics, the start of the 1950's saw an increase in the incidence of fractured teeth at the high school and college level. A survey by Vanet in 1950 showed that 733 teeth were injured by players at 62 colleges. The parents of young athletes were finding that the "football smile" was too high a price to pay for the benefits of participation in school athletics.

One of the finest public health services was provided by the Wyandotte Dental Society of Kansas City, Kan., which in 1953 fitted 540 football players with mouthpieces. Not one of the players suffered a tooth injury. The cost of a mouthpiece is less than half the cost of a pair of football shoes. Schools, parents and insurance companies spend more to repair broken teeth each year than it would cost to outfit the players with protective mouthpieces.

The dentist as a professional man is interested in the prevention of dental injury. Many coaches seem to be reluctant to adopt a mouthpiece, probably because they confuse the present protective mouthpiece with the old-fashioned mouthpiece which had to be held between the teeth and removed to call signals. Coaches who have tried the individually fitted mouthpiece are enthusiastic. Most players welcome it. It can be fitted in three to five minutes; it provides complete tooth protection; it stays in place and it allows mouth breathing and clear speech.

The individually fitted mouthpiece results in a reduction of the incidence of mandibular fracture, injury to the temporomandibular joint and brain concussion.

Northeast Missouri State Teachers College, Kirksville, Mo.

Electrosurgery in dentistry

Walter I. Zeitz. *New York D.J.* 23:484-488 Dec. 1957

Electrosurgery utilizes a high-frequency current of sufficient intensity to raise the temperature of tissues beyond physiologic limits, thereby destroying the tissues. The heat is generated by the resistance of the tissues to the current. Electrosurgery differs from ordinary cauterization in that by electrosurgery the heat originates in the tissues instead of being conveyed to them.

A review of the uses of electrosurgery for operative, periodontal and prosthetic purposes in dentistry reveals the following advantages:

1. The electrosurgical scalpel never becomes heated, in contrast to the cauter.

2. The penetration effect can be controlled accurately.

3. With proper technic, little coagulum will form on the blade and dissection will be even.

4. With proper technic, there is no danger of injuring soft tissue, bone or teeth.

5. Hemorrhage is avoided.

6. The high-frequency current cuts tissue, it does not burn tissue.

7. No pressure of the electrode against the tissue is required for incision.

8. Smaller, more delicate electrodes can reach regions inaccessible to the knife, particularly in the molar region.

9. Visibility is improved.

10. The heat of the tissue generated by the high-frequency current destroys bacteria in the operative field.

11. Tissue remnants can be removed completely when desired.

12. Bacteria in pockets will not enter the blood stream.

13. With the electrode it is easier to festoon gingival attachments to produce good gingival architecture.

Electrosurgery has the following disadvantanges in dentistry:

1. An offensive odor results.

2. Primary repair is slightly retarded.

The only contraindications to electrosurgery are infections and highly inflamed regions.

With proper technic, there is a definite place in dentistry for electrosurgery.

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General Dental Council: dental hygienists

Brit.D.J. 103:149-150 Aug. 20, 1957

Ancillary Dental Workers Regulations made by the General Dental Council under section 18 of the Dentists Act, 1956, which have been approved by the Privy Council, laid before Parliament and approved by a resolution of each House of Parliament, came into force on August 1, 1957. The immediate effect of these regulations is to establish a class of auxiliary dental workers to be called dental hygienists. The General Dental Council will keep a roll of dental hygienists, and persons entered on this roll will be permitted to carry out dental work of the following kinds under the direction of a registered dentist who has examined the patient and has indicated the course of treatment to be provided: (1) cleaning and polishing teeth; (2) scaling teeth; (3) the application to the teeth of solutions of sodium or stannous fluoride, and (4) giving advice on matters relating to oral hygiene.

Dental hygienists may be employed both in the national or local authority health services and in general practice, but those employed in general practice are permitted to carry out dental work only under the direct personal supervision of a registered dentist who is on the premises while the hygienist is carrying out the work.

The General Dental Council may approve arrangements for the training and examination of dental hygienists. It will be some time before hygienists qualify under these new arrangements, but those who have already been trained and have received the Minister of Health's Certificate of Proficiency in Oral Hygiene are entitled to enrollment immediately. The fee for the first enrollment is $2.80 and the annual fee for retention of a name on the roll after March 31 in any year is also $2.80.

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A contribution to the study of caries

(Una contribución al estudio de la caries)

P. Prager. *Rev.espan.estomat.* 5:131-134 March-April 1957

Under the impetus of the experimental method introduced during the Renaissance, science advanced farther in the few succeeding centuries than it had in all the preceding millenniums. In this method, technical means and logic are combined: precision instruments of fantastic capacity are used for purposes of simple or experimental observation and so too are all the resources of logic—supposition, imagination, idealization, analysis, synthesis, comparison and the rest. Statistics also play an important part in the investigations. As a result, the publication of a work based only on a few superficial and indefinite observations and on confused speculations is not now considered admissible, especially when it is intended to cast doubt on the one point in regard to which scientific dental circles seem to be in complete agreement; that is, the demineralization by acids of the hard substances of the tooth in the process of decay. Nevertheless, this is what the author proposes to do in this paper.

It has long been known that the calcified substance of the teeth is the most refractory and resistant part of the body, and yet one that is

easily soluble in acids. It was logical, before the era of bacteriology, to attribute decay to the action of acids, even though no explanation could be given of the origin of the acids. Subsequently, the discoveries of Pasteur provided the explanation and led to Miller's bacterial theory, according to which the enamel is decalcified by acids produced from carbohydrates by microorganisms which then penetrate into the tooth and destroy it by their ferments. This theory, completed and slightly modified by the discovery of the bacterial plaque, then came to be accepted almost unanimously by the profession.

Admittedly, acid is capable of decalcifying the hard tissues of the tooth, and various types of microorganisms found in carious lesions are producers of acid. Furthermore, lesions similar to those of caries can be produced by means of acids in extracted teeth. These facts, however, do not prove that the microorganisms, the pathogenic agents of caries, use the acids produced for the decalcification of the hard tissues in question.

Complex carbohydrates and proteins may be broken down in the laboratory by heating them in acids, but living bodies possess enzymes capable of accomplishing the same result more efficaciously. It does not seem logical to suppose that organisms biologically specialized to find their optimal living conditions in the tooth make use of the technics employed in human laboratories. Insects capable of generating light and fish that live in the depths of the ocean need neither batteries nor light bulbs.

The production of organic acids by the agents of caries does not mean that they are intended to decalcify the tissues. Free hydrochloric acid is found in the stomach, but the foods are broken down by enzymes and the role of the acid is merely to provide the optimum concentration of hydrogen ions.

The process of producing caries artificially in extracted teeth is remarkably slow, notwithstanding the fact that it is carried out in circumstances free from interference and with large quantities of chemicals. Living organisms, however, rarely if ever suffer themselves to be invaded and partially destroyed without offering some sort of resistance. Little is known about resistance, but no one can deny that there are persons living in surroundings in which 95 per cent of the population is affected by caries, whose resistance is so great that they remain immune in this respect throughout their lives.

The slowness with which caries is produced artificially is in pronounced contrast to the speed with which it destroys the dental tissues in living subjects. Not infrequently a tooth that appeared sound in a bitewing film will have a cavity that extends to the pulp six months later. Moreover, the opening of the cavity in the enamel may be almost imperceptible and yet it will be full of detritus. In such circumstances, how could the pathogenic organisms obtain carbohydrates enough to produce the quantity of acids needed for such rapid and extensive destruction in an adverse medium?

The theory that in caries the dental tissues are dissolved by acids was formulated before the bacterial era when no other means by which the dissolution of the hard tissues could be brought about was known. Knowledge of the miracles of the enzymes and of bacteriology came almost simultaneously. Today it is known that the organisms responsible for caries possess enzymes capable of producing acids from carbohydrates, proteolytic enzymes, and all the other enzymes needed by the organism in fulfilling its biological functions. Similarly, it is known that many known and unknown enzymes enter into the metabolism and the accomplishment of every biological function. How can it be supposed that biological organisms specially equipped to penetrate and to destroy the dental tissues in the search for optimal living conditions for themselves, and agents capable of overcoming the opposition of the organism invaded, have to make use of weak organic acids and that they have no enzymes capable of decalcifying or dissolving the enamel and the dentin?

When the acid theory of caries was born, and also when it was reshaped by Miller, little was known of the physiological and pathological processes that bring about the destruction of the bone, cementum and dentin. Regularization of the callus of a fracture, reorganization of the trabecular system of bone when necessary, resorption of the roots of deciduous teeth, the destruction of bone in inflammatory conditions, pathological resorption of the roots—all these are processes effectuated by enzymes. Just as en-

zymes take part in the physiological formation and destruction of the hard tissues, so the pathological organisms that cause caries must have similar enzymes. This would explain the appearance of lesions at sites where the pathogenic agents seem to have everything against them, as for instance at the point of the cusp of a cuspid.

Although the author is aware that this theory is susceptible of instrumental and experimental investigation, certain special circumstances prevent him from carrying out the work. As for the importance he attributes to the theory, it may be said that although it may not appear to have any practical usefulness, the question is one of arriving at the truth, because the truth is so precious to science that not even the smallest particle of it lacks value.

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The growing shortage of dentists in the United States

Quentin M. Smith. *Am.J.Pub.Health* 48:38-45 Jan. 1958

The supply of dentists in the United States has been lagging behind the growth of the population for more than a quarter of a century—since the successful effort by the dental profession to raise the educational standards of dental schools in the 1920's. Dental school enrollments continued to fall off during the depression years and by 1939 not enough dentists were being graduated to replace those who had died or retired.

Since 1945 new dental schools and increased classroom space in old schools have been added, so that today the dental schools are graduating nearly twice as many students as they were in 1938. Yet, the shortage has grown worse. In 1930, when there were 71,000 dentists, there was one dentist for every 1,730 people. Today with close to 80,000 nonfederal dentists, the ratio is 1:2,170.

In 1930 the nation was paying for the services of one dentist out of every 1.8 million dollars of its income (expressed in 1955 dollars). By 1940 this figure had risen to 2.2 million; by 1950, to 3.3 million, and by 1955 to 4.0 million.

The differences which exist at present from state to state and from region to region in the number of dentists being supported out of identical amounts of consumer income are significant and disturbing. The spread in the amount of income out of which the services of one dentist are paid for ranges from less than 3.0 million dollars to nearly 8.0 million dollars; the best supplied state has almost three times as many dentists as the least well supplied state. The average state supports one dentist for every 4.3 million dollars of income, and the 24 top ranking states, one for every 3.6 million. Probably, the amount a state now spends on dental care is limited by the numbers of dentists available. But in the final analysis, the amount spent is determined by the people of the state. A better educated population, a population more concentrated in urban areas, or one which contains relatively fewer old folks or very young people will demand more dental care out of the same amount of total income.

About 6,000 additional dentists would be needed to provide every region with a supply of dentists large enough to meet the demand level already being satisfied in the average state today. It would take nearly 13,000 additional dentists to satisfy the demands equivalent to those being met in the top 24 states. This latter figure is the more realistic estimate of the current national deficit.

The greatest immediate need for dentists is in the Great Lakes Region, followed by the Far West, the Middle Atlantic, the Southwest, New England and the South. Compared with the rest of the nation, two regions—the Midwest and the Rocky Mountain states—are in good shape. There are 17 states which have enough dentists to meet demands for service equivalent to those being met today in the hypothetical high-average state.

If the demands for dental care are to be met as they arise, prompt and intelligent action is needed.

Division of Dental Resources, Public Health Service, Washington, D.C.

Doctoral and Masters' dissertations

In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

Structure and modifications of the cytologic constituents of the pulp in the aged (Struttura e modificazioni del contingente citologico nella polpa dentale dei senescenti). *Nicola Chiaravalle. 1955.* SPEC.ODONT. *School for Dental Specialties, Dental Institute, University of Bari, Italy.*

Gnathodynamics and resistance of various types of dental materials under the stress of masticatory forces (Dati gnato-dinamometrici e resistanza dei vari tipi di otturazione alle forze della masticazione). *Pasquale Nigro. 1956.* SPEC.ODONT. *School for Dental Specialties, Dental Institute, University of Bari, Italy.*

"Pioral" as an aerosol treatment in periodontal disease (Il "Pioral" per areosol-terapia nelle parodonziopathie). *Giuseppe Napoli. 1956.* SPEC. ODONT. *School for Dental Specialties, Dental Institute, University of Bari, Italy.*

Titration of alcohol constituents in the saliva of patients with acute ethylism (Titolazione alcool-salivare nell'etilismo acuto). *Vito Wilson Criacci. 1957.* SPEC.ODONT. *School for Dental Specialties, Dental Institute, University of Bari, Italy.*

Use of "Lisozima" in the prevention of periodontal disease (L'uso del "Lisozima" nella perapia delle Parodontopatie). *Vito Tamburini. 1957.* SPEC.ODONT. *School for Dental Specialties, Dental Institute, University of Bari, Italy.*

Cytologic examination of human adenoids (Zytologische Untersuchungen an menschlichen Gaumenmandeln). *Gerhard Frohring. 1956.* DR.MED. DENT. *University of Würzburg, Germany.*

Changes in the oral cavity occurring during pregnancy (Veränderungen in der Mundhöhle während der Schwangerschaft). *Hans Klein. 1956.* DR.MED.DENT. *University of Würzburg, Germany.*

Hypersensitive reactions of the oral mucosa and the lips to newly introduced acrylic resins (Überempfindlichkeits-Reaktionen der Mundschleimhaut und der Lippen: Unter besonderer Berücksichtigung der neuzeitlichen Kunststoffe). *Friedrich Haeger. 1956.* DR.MED.DENT. *University of Würzburg, Germany.*

History of dental education at the University of Göttingen (Zur Geschichte des Unterrichts in Zahnheilkunde, besonders an der Universität Göttingen). *Fritz Kampmann. 1956.* DR.MED. DENT. *University of Göttingen, Germany.*

Problem of anchorage in orthodontics (Das Problem der Verankerung in der Kieferorthopädie). *Ingrid Roehle. 1956.* DR.MED.DENT. *University of Bonn, Germany.*

Treatment of periodontitis with the toothpaste "Aronal" which contains vitamins A and D (Die Behandlung entzündlicher Paradontopathien mit einer Vitamin A und D haltigen Zahnpasta "Aronal"). *Dieter Vaassen. 1956.* DR.MED.DENT. *University of Bonn, Germany.*

Allergic reactions occurring after handling antibiotics (Allergische Erscheinungen nach Umgang mit Antibioticis). *Cäcilia Wystrach. 1956.* DR. MED.DENT. *University of Bonn, Germany.*

Temperature and pain threshold of human pulps (Innentemperatur und Schmerzschwelle des menschlichen Zahnes). *Gerlinde Mann. 1956.* DR. MED.DENT. *University of Heidelberg, Germany.*

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